

The University of Chicago

THE PRAGMATIC PHILOSOPHY
OF C. S. PEIRCE

A PART OF A DISSERTATION SUBMITTED TO THE
FACULTY OF THE DIVISION OF THE HUMANITIES
IN CANDIDACY FOR THE DEGREE OF DOCTOR OF
PHILOSOPHY

DEPARTMENT OF PHILOSOPHY
MARCH, 1942

By
MANLEY H. THOMPSON, JR.

CHICAGO, ILLINOIS

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NOTE

Certain references in the following pages are to parts of the dissertation which are not included in this "essential portion." The complete dissertation is to be found in the University of Chicago Libraries.



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INTRODUCTION

Peirce declared that the aim of his intellectual endeavors was "to outline a theory so comprehensive that, for a long time to come, the entire work of human reason, in philosophy of every school and kind, in mathematics, in psychology, in physical science, in history, in sociology, and in whatever other department there may be, shall appear as the filling up of its "details" (1.1).¹ In constructing this outline his concern was "not so much to set each brick with nicest accuracy, as to lay the foundations deep and massive" (1. 1).

The present study is first of all an attempt to reconstruct this outline from Peirce's scattered writings. The two chapters printed here are concerned with an examination of his later writings as the final expression of his system. The preceding five chapters examined Peirce's earlier writings (primarily those comprising a collection of essays called Search for a Method) and attempted to show that they contain a philosophic system in rudimentary form. The fundamental unity of the writings consisted in a persistent effort to make the formal science of symbolic operations, which Peirce at first designated simply as logic, the architectonic science of all intellectual activity. As an inevitable consequence of this position, knowledge and reality were explained with reference to the outcome of certain symbolic operations, or, in other words, with reference to the outcome of inquiry. Inquiry itself is always a process and it is impossible to say that at any given finite stage in the process the outcome is certain to be knowledge of reality. Consequently, reality must be defined as the object of an opinion which is the outcome of inquiry indefinitely extended. This procedure leads at once to the problem of bringing the finite actions of individual men into accord with

¹This reference is to Volume 1, paragraph 1, of the Collected Papers of Charles Saunders Peirce, ed. Charles Hartshorne and Paul Weiss (6 vols.; Cambridge: Harvard University Press, 1931-35). All references to these papers will be given in this manner, following the custom of the editors. When a quotation from Peirce is cited only as appearing in an independent publication, it has not been reprinted in the Collected Papers.

inquiry conceived as an indefinitely extended process.

In order to achieve this accord, it seemed necessary to base all knowledge of reality on a faith in the indefinite extension of intellectual inquiry. Inasmuch as this faith is presupposed by all knowledge of reality and cannot itself be explained as an instance of such knowledge, Peirce's system seems to end in paradoxes. The fundamental tenet of his realism, that all reality is explicable, must presuppose an inexplicable faith concerning the reality of inquiry. Moreover, the one method of fixing belief which is not opposed by the social impulse to criticize and share the beliefs of others, namely, the scientific or inductive method, comes to rest finally on a belief which cannot itself be fixed by this method. For faith in the indefinite extension of intellectual inquiry is a presupposition of induction and must therefore be fixed by a method other than the inductive method, by sheer tenacity, taste, or arbitrary authority. Since the first of these paradoxes arises from an attempt to explain reality as the knowable in general, it may be termed the cosmological paradox in Peirce's system; since the second arises from an attempt to explain the method for obtaining knowledge, it may be termed the logical paradox.

These two paradoxes were found to parallel two central problems in Peirce's system: the cosmological problem of explaining the relation between mind and nature and the logical problem of explaining the validity of induction. An examination of Peirce's metaphysics or cosmology showed that his final solution of the former problem depended on his solution of the latter. His final attempt to resolve the paradoxes and to construct a coherent system of philosophy is thus to be found in the development of his logic.

CHAPTER V

THE FINAL SYSTEMATIZATION OF PEIRCE'S PHILOSOPHY

According to the conception of logic developed in Peirce's early papers, considered in the first chapter of the present study, logic was the science of symbols, or of second intentions, and the three references involved in any symbol afforded the basis for distinguishing the three fundamental branches of logic. These three references were themselves explained ultimately by the logic of relatives as expressions of the categories, or the fundamental forms of relation. All important concepts of logic, such as term, proposition, and argument, could in turn be explained and classified as various croppings-out of these categories in the continuous process of logical operations. In the later developments of Peirce's logic, several distinct sciences evolved from these considerations, which, in the order of their generality, comprised mathematics, phenomenology, and the normative sciences, with the three branches of logic forming the third of the latter sciences. Since each of these disciplines was prior to, and therefore independent of, metaphysics or cosmology, the resolution of the aforementioned paradoxes in Peirce's system must be sought in a context which embraces all of them. The present chapter will be concerned with an examination of these sciences as a possible means of such resolution.

1. Speculative Grammar and Ontology

A. The manner in which metaphysics depends on prior sciences for principles of ontology, categories, and rules of inquiry, as well as the relations which mathematics, phenomenology, and logic bear to each other and to metaphysics, is clearly indicated in two papers apparently written about three years after the series on cosmology considered in the preceding chapter: The Regenerated Logic (The Monist, Vol. VII, 1896; 3, Paper XV), and The Logic of Mathematics: An Attempt to Develop My Categories from Within

(ca. 1896; 1, Bk. III, chap. 4). The second of the papers is concerned in large part with what Peirce later called "phenomenology," a term which appears in none of the writings in the Collected Papers before the Minute Logic, 1902. The late appearance of this term in the development of Peirce's system may be accounted for in part at least by the tendency for phenomenological considerations to become subsumed under either those of mathematics or of logic. Such tendency can be seen from a consideration of the opening statements of the second paper, where Peirce remarks:

Although the present paper deals with mathematics, yet its problems are not mere mathematical problems. . . . The questions which are here to be examined are, what are the different systems of hypotheses from which mathematical deduction can set out, what are their general characters, why are not other hypotheses possible, and the like. These are not problems which, like those of mathematics, repose upon clear and definite assumptions recognized at the outset; and yet, like mathematical problems, they are questions of possibility and necessity. What the nature of this necessity can be is one of the very matters to be discovered [1. 417].

It is specified that mathematics never has occasion to appeal to logic for guidance in its reasoning, since "no disputes about reasoning arise in mathematics which need to be submitted to the principles of the philosophy of thought for decision." Mathematics "performs its reasonings by a logica utens which it develops for itself, and has no need of any appeal to a logica docens" (1. 417). This statement is clarified by the position, referred to briefly in the Regenerated Logic, that "mathematical thought" is "diagrammatical or iconic" (3. 429). Peirce's later writings contain considerable treatment and development of this view of mathematical reasoning, of which a clear summary statement occurs in the section on the classification of sciences in the Minute Logic. Mathematics is a science "which does not undertake to ascertain any matter of fact whatever, but merely posits hypotheses, and traces out their consequences."

It is observational, in so far as it makes constructions in the imagination according to abstract precepts, and then observes these imaginary objects, finding in them relations of parts not specified in the precept of construction. This is truly observation, yet certainly in a very peculiar sense; and no other kind of observation would at all answer the purpose of mathematics [1. 240].

The rules for such iconic reasoning can be supplied only by the precept of construction and are thus generated by the reasoner

as he constructs that about which he is to reason. The very activity of the mathematician, in other words, creates a kind of logic in use, or logica utens, which affords all the rules governing his activity. The scientist engaged in inquiry other than pure mathematics, on the contrary, must reason about what he has not himself constructed and hence must act in accordance with rules determined independently of his activity. Thus, doubts concerning the validity of a mathematical inference can always be answered by ascertaining how the mathematician meant to construct a given diagram, while similar doubts in any other science can only be settled by reference to general rules of inference already exhibited as valid by a separate discipline, by a logica docens.¹

An explanation of the necessity which accompanies the result of mathematical observation involves a consideration of characteristics which belong to observation as such, irrespective of whether it purports to be of something real or imaginary. Peirce declares in the essay The Logic of Mathematics: An Attempt to Develop My Categories from Within:

This much, however, is indisputable: if there are really any such necessary characteristics of mathematical hypotheses as I have just declared in advance that we shall find that there [are], this necessity must spring from some truth so broad as to hold not only for the universe we know but for every world that poet could create. And this truth like every truth must come to us by the way of experience. No apriorist ever denied that. The first matters which it is pertinent to examine are the most universal categories of elements of all experience, natural or poetical [l. 417].

Such examination constitutes precisely what Peirce called a few years later "phenomenology" or "phaneroscopy," a science which would seem to be differentiated from pure mathematics in that it considers the formal elements present in any experience whatsoever and is not limited to observing the formal elements of imaginary constructions. However, the problems arising from such consideration, "like mathematical problems," "are questions of possibility and necessity," and as Peirce remarked, circa 1904, "phaneroscopy has nothing at all to do with the question of how far the phaneros it studies correspond to any realities" (l. 287). The line of

¹Peirce's views concerning the observational character of necessary reasoning led him to represent inferential processes by a system of graphs which is presented in Vol. 4 of the Collected Papers.

demarcation between phenomenology and mathematics is thus a difficult one to draw, and one which inevitably involves the relation of these two sciences to logic.

The close connection between mathematics and logic is the subject of considerable discussion in the Minute Logic. In the section on the classification of sciences Peirce remarked:

The hypotheses of mathematics relate to systems which are either finite collections, infinite collections, or true continua. . . . The study of finite collections divides into two suborders: first, that simplest kind of mathematics which is chiefly used in its application to logic, from which I find it almost impossible to separate it; and secondly, the general theory of finite groups [2. 283].

Logic, then, is intimately associated with the simplest mathematics which is specified in "An Outline Classification of Sciences," 1903, as that to which all other branches of mathematics must have recourse (cf. 1. 185). Chapter three of the Minute Logic is devoted entirely to a consideration of this simplest mathematics, which can be identified with formal logic.

Mathematical logic is formal logic. Formal logic, however developed, is mathematics. Formal logic, however, is by no means the whole of logic, or even its principal part. It is hardly to be reckoned as a part of logic proper. Logic has to define its aim; and in doing so is even more dependent upon ethics, or the philosophy of aims, by far, than it is, in the methodeutic branch, upon mathematics [4. 240].

The two branches of the simplest mathematics are called, respectively, dichotomic and trichotomic mathematics (cf. 4. 250 ff., and 4. 307 ff.). In respect to the latter, "the most fundamental fact about the number three is its generative potency" (4. 309), since, as Peirce frequently remarked elsewhere, polyadic relations are nothing but combinations of triadic relations (cf., for example, 1. 347). Euler's diagrams comprise an outstanding example of dichotomic mathematics, but the "worst" fault (4. 367) of his system is that it "affords no means of exhibiting reasoning, the gist of which is of a relational or abstractional kind. It does not extend to the logic of relatives" (4. 356, article in Baldwin's Dictionary of Philosophy and Psychology, 2d ed., 1911). Consequently, the system is of interest primarily for "non-relative deductive logic, that is, the doctrine of the relations of truth and falsity between combinations of non-relative terms" (4. 370, article in Baldwin's Dictionary of Philosophy and Psychology). It would seem from these considerations that dichotomic mathematics

provides the formal structure for ordinary syllogistic, while trichotomic mathematics is necessary for the formal structure of the logic of relatives. Hence, the two branches of the simplest mathematics present in diagrammatical thought the formal reasoning employed by any logical analysis, so that while these branches considered in themselves are properly mathematical, yet as formally identical with syllogistic and the logic of relatives they can be called "formal logic." Such mathematics is to be differentiated from logic proper only in the sense that the latter arises when the former is regarded as the basis for rules of thinking, or of the use of signs. By this procedure, logic proper becomes a normative science, dependent upon mathematics for its norms, and possessing three branches arising from the three references involved in any sign.

The close affinity between phenomenology and logic arises from the circumstance that both sciences are dependent upon the same branch of mathematics, and since this branch may be called either the simplest mathematics or formal logic, Peirce could always refer to his categories as an "outgrowth from formal logic" (5. 469, ca. 1908). Phenomenology or phaneroscopy as an attempt to discern the common elements in all experience need presuppose nothing from a prior science except an analysis of the formal characteristics which apply to all conceivable objects. Such analysis is precisely what is given by trichotomic mathematics, or that branch of the simplest mathematics which constitutes the formal structure of the logic of relatives. Peirce wrote in a work on his categories, circa 1894: "A thorough study of the logic of relatives confirms the conclusions which I had reached before going far in that study. It shows that logical terms are either monads, dyads, or polyads, and that these last do not introduce any radically different elements from those that are found in triads. . . ." (1. 293). The exhaustiveness of this as a formal classification of all objects can be explained by the simplest mathematics, which demonstrates that the classification holds for all possible imaginary constructions or diagrams. For inasmuch as every object of possible experience can be represented by the imagination, this demonstration suffices to show that the classification applies to all objects, not, however, in their immediate character as phenomena, but only in the sense in which objects possess the formal

properties of their icons.¹ Inasmuch, then, as phenomenology "treats of the universal Qualities of Phenomena in their immediate phenomenal character" (5. 122, lectures on pragmatism, 1903), it may be regarded as the science which investigates how the formal relations revealed by mathematical observation of icons are present in the objects of the icons, or in the phenomena themselves.

In these terms, phenomenology becomes a necessary step in the transition from the simplest mathematics to logic proper, since mathematical relations can be made norms for the use of signs only when it is clear that they apply directly to all possible experience. For inasmuch as every modification of consciousness is an inference, every experience is a sign-process, and hence universal norms for the use of signs must be shown to arise from the character of experience as such. The fundamental concepts of logic can be explained as the croppings-out of basic forms of relation only when such forms have been shown to be those present in every sign-process, namely, in every experience. The most universal sciences in Peirce's system are thus analyses of various aspects of a single process, which is at once constitutive of thought, experience, and signification. Mathematics reveals the formal elements of all thought by exhibiting the fundamental forms of relation present in any diagram or imaginative construction; phenomenology shows that these same formal elements are constituents of the objects of the diagrams, and hence categories of experience itself. The universal necessity of mathematics is explained by this latter consideration in that the formal elements which are basic for every diagram are shown to arise from the nature of experience and not from any peculiarities of diagrams. Finally,

¹Cf. the statement, 1906, concerning the way in which a mathematical form represents its objects.

A mathematical form of a state of things represents only the samenesses and diversities involved in that state of things, without definitely qualifying the subjects of the samenesses and diversities. It represents not necessarily all of these; but if it does represent all, it is the complete mathematical form. Every mathematical form of a state of things is the complete mathematical form of some state of things. The complete mathematical form of any state of things, real or fictitious, represents every ingredient of that state of things except the qualities of feeling connected with it. It represents whatever importance or significance those qualities may have; but the qualities themselves it does not represent [5. 550].

logic takes into account the fact that every thought or experience is also a process of signification, and shows how the fundamental categories of experience provide norms for the use of signs.

B. In Peirce's later writings the first division of logic proper, speculative grammar, is also referred to as epistemology (2. 206, 1902) and stoicheiology¹ (5. 446, 1905; 4. 9, ca. 1906). In the paper Regenerated Logic it is described as the study which considers "those properties of beliefs which belong to them as beliefs, irrespective of their stability. For it must analyze an assertion into its essential elements, independently of the structure of the language in which it may happen to be expressed" (3. 430). Such a study, according to the Minute Logic, "properly antecedes" critic (2. 206), the second division of logic, "which, setting out such assumptions as that every assertion is either true or false, and not both, and that some propositions may be recognized to be true, studies the constituent parts of arguments and produces a classification of arguments," and "is often considered to embrace the whole of logic" (2. 205). Speculative grammar is thus a study of the elements or first principles which are presupposed by the analysis commonly referred to as logic. There is explicit indication in the Regenerated Logic that the definition of truth or reality is given by speculative grammar. Peirce remarked in reference to Schröder's Logic that "only an introduction of one hundred and twenty-five pages rapidly examines the speculative grammar" (3. 431), and concerning the contents of this introduction:

as to an inquiry presupposing that there is some one truth, what can this possibly mean except it be that there is one destined upshot to inquiry with reference to the question in hand--one result, which when reached will never be overthrown? Undoubtedly, we hope that this, or something approximating to this, is so, or we should not trouble ourselves to make the inquiry [3. 432].

These statements are in complete agreement with the interpretation expressed above at the close of the preceding chapter that the principles of Peirce's ontology are established by maxims of speculative grammar. Inasmuch as these principles are either immediate results of an application of the pragmatic method, as

¹The term stoicheiology means "doctrine of elements" and is taken from Sir William Hamilton. Cf. his Lectures on Metaphysics and Logic (1864), p. 46.

the definition of reality, or at least require an application of this method for their establishment, as the doctrine of objective idealism, it would seem that pragmatism is a maxim of speculative grammar. The nearest approach to an explicit indication in the Collected Papers of this interpretation of pragmatism occurs in a passage in the opening chapter of the Minute Logic. In a section entitled "Clearness of Ideas" Peirce remarks:

After the thorough and careful discussion of all the above matters, involving many nice questions, including the one concerning which logicians are today disputing more than any other, many volumes having been devoted to it, I mean that of the nature of the proposition, and after every opinion has received its respectful hearing, we will come at last to the problem of Clearness, than which none in logic is more practically vital. I treated this subject in 1877, and enunciated a maxim, the acceptance of which constitutes the position called Pragmatism, a question which has of late years largely occupied philosophers. My opinion remains substantially the same now as then; but all those years have not passed without my learning something. I can now define the proposition more accurately, so as to close the door against those who would push the doctrine further than I ever intended [2. 99].

The next section is entitled "Abduction, Deduction, and Induction," and begins with the sentence: "Critical logic is then to be taken up" (2. 100).

Peirce's statement later in the Minute Logic that speculative grammar examines "in what sense and how there can be any true proposition and false proposition, and what are the general conditions to which thought of signs of any kind must conform in order to assert anything" (2. 206), gives clear indication that the problem of the nature of the proposition falls within this first branch of logic (cf. 5. 29). Pragmatism, then, as a method for obtaining clearness of ideas the development of which is subsequent to an analysis of the conditions of assertion is the culmination of the stoicheiology of logic. The circumstance that Peirce in all of his later expositions of pragmatism published in the Collected Papers referred to the doctrine as a "maxim of logic," without specifying in which of the three branches of logic it was to be included, is perhaps explained by the fact that none of these expositions was given in a context which involved a detailed consideration of logic itself.¹ The mere identification

¹In the lectures of 1903, Peirce identifies pragmatism with "the logic of abduction," but argues that it in no sense directly affects deduction and induction. Cf. infra, p. 177. While

of pragmatism as a maxim in one of the three branches of logic, unaccompanied by an exposition of each of these branches in its relation to the other two, would in no way contribute directly to a clarification of the doctrine. The reference to pragmatism in the Minute Logic is the only instance in the Collected Papers in which the context would warrant such identification, and if Peirce had completed the project outlined in the opening chapter of that work, he undoubtedly would have made the place of pragmatism as a maxim of logic far more explicit.

C. The generality and certainty of speculative grammar as an epistemological analysis affording the principles of logic, and hence those of metaphysics and all the special sciences, is clearly described in a passage in the Regenerated Logic.

Now, the only psychology being a special science, which ought itself to be based upon a well-grounded logic, it is indeed a vicious circle to make logic rest upon a theory of cognition so understood. But there is a much more general doctrine to which the name theory of cognition might be applied. Namely, it is that speculative grammar, or analysis of the nature of assertion, which rests upon observation, indeed, but upon observation of the rudest kind, open to the eye of every attentive person who is familiar with the use of language, and which, we may be sure, no rational being, able to converse at all with his fellows, and so to express a doubt of anything, will ever doubt [3. 432; cf. 2. 227].

Speculative grammar thus involves a type of analysis and observation quite similar to that used in mathematics and phenomenology, and is differentiated from these last two sciences primarily by the fact that it regards the processes analyzed by them as processes of signification. It is precisely because of this fact that Peirce could assert at the beginning of Regenerated Logic that we must "appeal for our logical principles to the science of mathe-

this might seem to make pragmatism belong properly to the first branch of "critic," it must be remembered that on Peirce's analysis a perceptual judgment "shades into" an abductive inference "without any sharp line of demarcation between them" (cf. *infra*, pp. 176-77) and that consequently an analysis of assertion would inevitably pass into one of abductive inference or hypothesis. This is, of course, but an application of Peirce's general principle that every modification of consciousness is an inference. Pragmatism, then, is to be identified with the logic of abduction precisely because it completes the analysis of significant assertion given by speculative grammar. The function of pragmatism in the logic of abduction is examined below in chap. vi, sec. 1.

mathematics" (3. 427).

After the above statement, Peirce continues:

This double assertion, first, that logic ought to draw upon mathematics for control of disputed principles, and second that ontological philosophy ought in like manner to draw upon logic, is a case under a general assertion which was made by Auguste Comte, namely, that the sciences may be arranged in a series with reference to the abstractness of their objects; and that each science draws regulating principles from those superior to it in abstractness, while drawing data for its inductions from the sciences inferior to it in abstractness [3. 427].

This conception of a hierarchy of the sciences is considered more at length in the Logic of Mathematics, and the relation between logic and metaphysics is described as follows.

Metaphysics consists in the results of the absolute acceptance of logical principles not merely as regulatively valid, but as truths of being. Accordingly, it is to be assumed that the universe has an explanation, the function of which, like that of every logical explanation, is to unify its observed variety [1. 487].

The logical principles here referred to are those arising from "the logical categories of the monad, the dyad, and the polyad or higher set." These three concepts, of course, come ultimately from the simplest mathematics, and the analysis which makes them categories generative of logical principles is that of speculative grammar.¹

The transition from logic to metaphysics, and from metaphysics to the special sciences, can be explained in terms of an analysis of the types of laws applying to experience.

¹Peirce explains that while logic in the "narrow sense" is "the science of the necessary conditions of the attainment of truth," in the "broad sense" it includes three branches. This discussion occurs in a section devoted to the development of the conception of the dyad as a logical category, and after the three branches of logic have been described briefly, the remark is made: "The present inquiry is a logical one in the broad sense. It is a study of dyads in the necessary forms of signs" (1. 444). It is possible to interpret this statement as implying that the inquiry extends to all three branches of logic, but in light of Peirce's remarks on speculative grammar made in other passages quoted above, it would seem that he means the inquiry is logical only if "logic" be taken in the broad sense which includes speculative grammar or epistemology. However, even assuming the other interpretation, the character of the analysis leaves no doubt that it is primarily one of speculative grammar.

The laws of fact divide themselves at the outset into those which must be true if there be any true answer to every question that has a meaning, or, as we say, into laws logically necessary and laws logically contingent. To this division another is intimately connected. Namely, of laws logically contingent the most universal are of such a kind that they must be true provided every form which by logical necessity must be thought of a given subject is also a form of its real being. Calling this kind of necessity, metaphysical necessity, we may divide laws logically contingent into laws metaphysically necessary and laws metaphysically contingent [1. 483].

This last group is composed of those laws which are "such as are not necessarily involved in the literal extension to being of the necessary laws of logical truth" (1. 488). By further division, it is possible to proceed to laws of physics, dynamics, and of the other special sciences.¹

There is thus a single line of sciences in Peirce's system which begins with mathematics as the most abstract and runs through logic and metaphysics to the special sciences. Speculative grammar as the source of principles of ontology would be that branch of logic directly falling in the line; in terms of the later developments of Peirce's system, only the simplest mathematics would be involved, and phenomenology must be inserted between mathematics and logic. The relation of the simplest mathematics to phenomenology would then seem to parallel that of speculative grammar to metaphysics: in both cases, the latter science regards the purely formal principles of the first science as constitutive of elements of experience. However, the relation is not exactly parallel, since both the simplest mathematics and phenomenology are entirely within the realm of possibility and necessity, so that neither science discriminates between appearance and reality, while metaphysics is a science of reality and is possible only upon the assumption that the formal principles or categories of speculative grammar are truths of being. The continuity of the line of sciences is thus broken by the necessity for this assumption in-

¹cf. 1. 501 ff. The sciences of measurement, comprising the laws of space and time, bridge the gap between metaphysics and the special sciences. According to the classification of sciences in the *Minute Logic*, "they are thus of a nature intermediate between coenoscropy and idioscopy; but in the main their character is philosophical." "They form, therefore, a second subclass of philosophy, to which we may give the name of theories. As inquiry now stands, this subclass has but two divisions which can hardly rank as orders, but rather as families, chronothory and topothory" (1. 278).

volved in the passage from logic to metaphysics. The movement from the simplest mathematics through phenomenology to logic is continuous in that the three sciences pertain to three different aspects of every experience, and have no occasion to assume that the objects of investigation are reality and not appearance. Similarly, the movement from metaphysics through the special sciences is continuous in that all the sciences profess to be treating of reality and each science receives regulative principles from the more abstract sciences above it and observational data from the more special ones below it. The assumption required by the passage to metaphysics, then, breaks the continuity in the line of sciences, but divides it into two distinct realms, the movement in each of which is continuous.

The cosmological problem of relating mathematical to empirical order, or mind to nature, may now be understood as that of relating these two realms in the line of sciences. The upper realm, embracing the simplest mathematics, phenomenology, and speculative grammar, is entirely within the domain of mind because it deals solely with appearances and makes no attempt to determine truths of reality; while the lower realm, embracing metaphysics and the special sciences, is entirely within the domain of nature because it professes to contain only truths of reality. Any analysis in this lower realm is possible only upon the assumption that the categories of the upper realm are applicable to reality as distinct from appearance--in the words of Peirce, "it is to be assumed that the universe has an explanation, the function of which, like that of every logical explanation, is to unify its observed variety."¹ The doctrine of objective idealism affords a solution to the cosmological problem only if this assumption is made, since otherwise there would be no warrant for the assertion that reality, chance, law, and the like must be defined and related in such and such a way. In other words, if the universe has no logical explanation, terms of ontology become unintelligible.

This line of sciences in Peirce's system may be called the ontological line in that its order is determined by the degree of abstractness of the objects of scientific investigation and its one fundamental division arises from the establishment of ontological principles. In terms only of this line, the break in continu-

¹Cf. supra, p. 147.

ity occasions no logical difficulty, since the assumption involved may be justified as one necessary if there is to be any science of reality. However, as was seen above at the close of chapter iiii, a solution of the cosmological problem can show merely what must be the general character of the universe if it is to be susceptible of logical explanation, but it cannot show how true inferences about such a universe are possible. This latter question leads to the logical problem of explaining the validity of the assumption made in the construction of the ontological line, since to suppose that the universe is explicable is the same as to suppose that true inferences about it are possible. The consideration of the principles of metaphysics and the special sciences in terms of the ontological line is thus incomplete in that the establishment of these principles rests upon the assumption that the categories of speculative grammar provide truths of being, while the examination of the warrant for this assumption extends to the domain of critic, the second branch of logic, which examines the validity of induction and is outside the ontological line. Thus, while speculative grammar can present a definition of reality which must be accepted if reality is to be explicable, it cannot justify the assumption of this explicability. Critic presupposes the necessity of accepting the definition if reality is to be explicable and attempts to justify the assumption by showing that inductive inferences are sure in the long run to yield an explanation of reality, whatever the peculiarities of reality may be.

This necessity of appealing to critic for the validity of ontological principles can be explained further by the character of the definition of reality. For inasmuch as reality can only be defined with reference to the outcome of a process of inquiry, the assumption that categories of logic afford categories of reality means that the former must be exhibited in processes of inquiry. But since inquiry itself is possible only by virtue of the validity of induction, the assumption in question presupposes such validity. What has been referred to above as the cosmological paradox in Peirce's system arises precisely from the circumstance that the explicability of the universe presupposes the validity of induction while this validity in turn seems to rest upon an inexplicable faith in the possibility of infinite inquiry. The search for the resolution of such a paradox, consequently, must pass from the sciences in the ontological line to an examination

of critic as the branch of logic which treats of the validity of induction. The fact that Peirce in none of his writings in the Collected Papers dated later than 1894 returns to an attempt to classify the sciences in a single line in terms of the abstractness of their objects may be taken as an indication of the incompleteness of such analysis (which is specified as being an adaptation of Comte's classification).

2. Induction and Probability

A. Peirce's later considerations of the validity of induction for the most part constitute a development and elaboration of his earlier analysis. According to the Minute Logic where Peirce is outlining the material to be examined by "Critical Logic":

The discussion of probability naturally brings us to the interesting question of the validity of induction. I undertake to demonstrate mathematically that the validity of Induction, in the proper sense of the term, that is to say, experimental reasoning, follows through the lemmas of probabilities, from the rudiments of the doctrine of necessary consequences, without any assumption whatever about the future being like the past, or similar results following similar conditions, or the uniformity of nature, or any such vague principle. I shall set forth the reasoning in strict accuracy of form; and I defy anybody to find a flaw in it. The importance of the question for every man is tremendous [2. 102].

The manner in which these promises would have been fulfilled had Peirce completed the Minute Logic may be inferred from his subsequent remarks on the subject in other writings. According to his articles in Baldwin's Dictionary (Vol. II), there are three types of probable inference. The first constitutes what may be called "probable deduction," which falls within that branch of deductive logic called "the doctrine of chances," and which covers "all the ordinary and legitimate applications of the mathematical doctrine of probability" (2. 785). This kind of

probable inference is, by the definition of it, necessary inference. But necessary inference may be applied to probability as its subject-matter; and it then becomes, under another aspect, probable inference. If of an endless series of possible experiences a definite proportion will present a certain character (which is the sort of fact called an objective probability), then it necessarily follows that, foreseen or not, approximately the same proportion of any finite portion of that series will present the same character, either as it is, or when it has been sufficiently extended [2. 785].

That is, upon the assumption of a real or objective probability

such as that the frequency of heads in a series of tosses of a coin is $1/2$, it necessarily follows that approximately the same number of tosses in any finite series will either turn up heads half the time or will do so when sufficiently extended.

This type of probable inference "is governed by precisely the same principle as the inductive inference, but applied in the reverse way," since what is here inferred is in the case of an inductive inference a premiss, and conversely. For "it is not here true that the relation of the facts laid down in the premisses to the fact stated in the conclusion, which makes the former significant of the latter, requires the recognition of the conclusion" (2. 785). An inductive inference, then, begins with a frequency observed in a finite series and proceeds to the conclusion that a real probability of such and such a value exists, or in other words, it "simply evaluates an objective probability" (2. 775). The characters whose occurrences constitute the frequency in question must be "predesignated," namely, "specified in advance of or at least, independently of, any examination of the facts" (2. 789), since otherwise the entire procedure would provide no confirmation of the existence of an objective probability. Induction is thus a kind of probable inference "whose business consists in testing a hypothesis already recommended" (2. 755), namely, in evaluating and confirming the existence of an objective probability already assumed to hold in respect to certain designated characters. An inductive inference, consequently, as the reverse of probable deduction, requires a recognition of the conclusion in that the characters involved in the observed frequency stated in the premisses are determined by the hypothesis which is to be established by the conclusion.

The third kind of probable inference is "presumption, or more precisely, abduction," and its function is to furnish "the reasoner with the problematic theory which induction verifies" (2. 776). This "is the only kind of reasoning which supplies new ideas, the only kind which is, in this sense, synthetic" (2. 777). Hence,

it appears that there is a mode of inference in which the conclusion is accepted as having some chance of being true, and as being at any rate put in such a form as to suggest experimentation by which the degree of its truth can be ascertained. The only method by which it can be proved that a method, without necessarily leading to the truth, has some tolerable chance of doing so, is evidently the empirical, or inductive, method.

Hence, as induction is proved to be valid by necessary deduction, so this presumptive inference must be proved valid by induction from experience [2. 786].

This statement agrees with Peirce's declaration in the Minute Logic that the validity of induction follows from the doctrine of necessary consequences. The order of procedure in critical logic would thus be first to establish the doctrine of chances, or the calculus of probabilities, by means of necessary deduction, and then to demonstrate from this the validity of induction, which in turn justifies abductive inference. This is precisely the order outlined in the Minute Logic and also that followed in the early series "Illustrations of the Logic of Science," considered above in chapter iii. The most lengthy statement in the Collected Papers of the way in which the validity of induction follows from necessary deduction occurs in a passage in the lectures on pragmatism, 1903.

Induction consists in starting from a theory, deducing from it predictions of phenomena, and observing those phenomena in order to see how nearly they agree with the theory. The justification for believing that an experimental theory which has been subjected to a number of experimental tests will be in the near future sustained about as well by further such tests as it has hitherto been, is that by steadily pursuing that method we must in the long run find out how the matter really stands. The reason that we must do so is that our theory, if it be admissible even as a theory, simply consists in supposing that experiments will in the long run have results of a certain character. But I must not be understood as meaning that experience can be exhausted, or that any approach to exhaustion can be made. What I mean is that if there be a series of objects, say crosses and circles, this series having a beginning but no end, then whatever may be the arrangement or want of arrangement of these crosses and circles in the entire endless series must be discoverable to an indefinite degree of approximation by examining a sufficient finite number of successive ones beginning at the beginning of the series. This is a theorem capable of strict demonstration. The principle of the demonstration is that whatever has no end can have no mode of being other than that of a law, and therefore whatever general character it may have must be describable, but the only way of describing an endless series is by stating explicitly or implicitly the law of the succession of one term upon another. But every such term has a finite ordinal place from the beginning and therefore, if it presents any regularity for all finite successions from the beginning, it presents the same regularity throughout. Thus the validity of induction depends upon the necessary relation between the general and the singular. It is precisely this which is the support of Pragmatism¹ [5. 170].

¹The manner in which this relation constitutes a support of pragmatism is considered in the next chapter. Cf. infra, pp. 174-75.

This purely mathematical justification of induction makes no reference to the actual character of objects of inquiry, so that an inductive inference "does not depend upon any assumption that the series will be endless, or that the future will be like the past, or that nature is uniform, nor upon any material assumption whatever" (2. 784). The reference to "the necessary relation between the general and the singular" would thus involve nothing more than the mathematical propositions which demonstrate that single members of an endless series necessarily express a general law of succession. The objective probability which induction in the long run is fated to evaluate is, of course, precisely this sort of general law, and may be defined simply as "the ratio of frequency of a specific to a generic event in the ordinary course of experience" (2. 777).

According to an article on "Validity" by Peirce and Mrs. C. Ladd-Franklin in Baldwin's Dictionary, validity is "the possession by an argument or inference of that sort of efficiency in leading to the truth, which it professes to have" (2. 779). Since induction professes to do nothing more than "to commence a proceeding which must in the long run approximate to the truth" (2. 780), its validity is demonstrated when it is shown that such a procedure does so approximate to the truth. It is thus important to recognize that induction is valid only as a means of approximating the true value of an objective probability and that it is not to be understood as "lending a probability to its conclusion." For

it is nonsense to talk of the probability of a law, as if we could pick universes out of a grab bag and find in what proportion of them the law held good. Therefore, such an induction is not valid; for it does not do what it professes to do, namely, to make its conclusion probable [2. 780].

Thus, induction can test the abductive inference that the direction of the flow of heat from one body to another is determined by the temperatures of the respective bodies by showing approximately in what proportion of cases heat flows of itself from a body of low temperature to one of high, and this proportion constitutes an objective probability the statement of which would be the law of entropy. While the fact that this proportion continually remains equivalent to zero confirms the hypothesis that the direction of the flow is determined by the temperatures, it indicates nothing whatsoever about the probability of the law arising

from this confirmation. For inasmuch as the law is nothing but the expression of a probability, to speak of the probability of the law would be to speak of the probability of a probability, which is absurd.

The calculus of probabilities, consequently, has nothing to do with measuring the extent to which scientific knowledge falls short of certainty. In the notes of 1910 to the Doctrine of Chances, Peirce wrote: "I shall in these notes endeavor to mark the three ways of falling short of certainty by the three terms probability, verisimilitude or likelihood, and plausibility" (2. 662). The latter pertains only to abductive inference and thus arises in the case where a theory

that has not yet been subjected to any test, although more or less surprising phenomena have occurred which it would explain if it were true, is in itself of such a character as to recommend it for further examination or, if it be highly plausible, justify us in seriously inclining toward belief in it, as long as the phenomena be inexplicable otherwise [2. 662].

"Likelihood" pertains to an inductive inference, namely, to a theory "which is not yet proved but is supported by such evidence that if the rest turn out upon examination to be of a similar character, the theory would be conclusively proved" (2. 663). Peirce added: "any numerical determination of likelihood is more than I can expect." Finally, probability may be explained as a kind of habit "quite analogous to any habit that a man might have" (2. 664). This characteristic applies only to probable deduction and falls short of certainty in a totally different sense from that of plausibility or likelihood. For the uncertainty now arises from the actual character of the premisses and not from the fact that further evidence might show the inference to be false. One can infer the actual behavior of a die from an objective probability in a manner analogous to the way in which one can infer the actual behavior of a man from his habits: the inference is never as to what certainly will happen on a given occasion but only as to what certainly would happen in the long run.

B. Peirce's demonstration of the validity of induction, whatever may or may not be its mathematical merits, provides a justification for the assumption that the universe has an explanation only if a prior assumption be granted, namely, that the inductive method is practically possible as a means of inquiry. For inasmuch as the demonstration is professedly purely mathematical,

it permits only the assertion that if inquiry can proceed by valid inductions, then the universe will ultimately be explained, irrespective of its uniformity or lack of uniformity. While there is no need to assume that a series of experiments must be endless in order to obtain the true value of an objective probability, it is nevertheless impossible to have any assurance whatsoever that this value actually has been obtained from any finite number of experiments, no matter how large. Peirce's final analysis of induction and probability has thus failed to avoid the necessity for an appeal to faith in the indefinite extension of human inquiry in order to render the universe explicable. The notes added in 1910 to the Doctrine of Chances, the last remarks on probability appearing in the Collected Papers, open with a reaffirmation of this faith: "no man can be logical whose supreme desire is the well-being of himself or of any other existing person or collection of persons"¹ (2. 661). Induction, then, as merely commencing a procedure which in the long run is sure to lead to the truth is practically possible as a means of inquiry only in terms of an indefinite community of scientists capable of carrying on inquiry indefinitely long. There is never any positive assurance that an end obtained by finite inquiry affords even a close approximation to the true value of an objective probability.

When Peirce's system is considered only in respect to the sciences in the ontological line and the demonstration of the validity of induction given by critical logic, the two paradoxes mentioned above at the close of chapter iii inevitably result. The necessity for faith in the indefinite extension of human inquiry as a presupposition of the ontological line leads to the paradox that the universe is explicable only upon the assumption of an inexplicable faith, while the same necessity as a requirement of induction leads to the paradox that all beliefs may be fixed by true inductions only if based on a belief which cannot itself be fixed in this way. Peirce's later treatment of the cosmological problem of relating mind and nature and the logical problem of explaining the validity of induction has thus not altered the situation which resulted from the analysis in the Search for a Method: both of these problems are in effect subsumed under the problem of bringing human action into accord with the calculus of

¹Cf. supra, pp. 94-95.

probabilities, so that the entire analysis rests on an article of faith. The two fundamental realms in Peirce's system, the realm of the real sciences, namely, metaphysics and the special disciplines, and the realm of the sciences which do not profess to treat of reality, namely, mathematics, phenomenology, and logic, are thus to be related ultimately in terms of human action. The resolution of the two paradoxes, therefore, must be sought finally in the examination of logic as one of the normative sciences governing human action. The definition of reality as something determined by a process of inquiry and the pragmatic analysis of intellectual meaning in terms of practical effects are in perfect agreement with this circumstance.

3. Logic and the Normative Sciences

A. A consideration of logic as one of the normative sciences in Peirce's system may be best approached by beginning with an examination of the third branch of logic, since it is precisely this branch which is concerned with relating principles of logic to human action. The name most frequently applied to this study in the Collected Papers is "speculative rhetoric"; "methodeutic" is used almost as frequently, and when Peirce first employed the term "objective logic," he spoke of it as synonymous with these two terms (1. 444, ca. 1896), although in the Minute Logic he carefully distinguishes it from them as applying to a separate discipline (2. 111). In the latter work, speculative rhetoric or methodeutic is described as searching for "a method of discovering methods."

This can only come from a theory of the method of discovery. In order to cover every possibility, this should be founded on a general doctrine of methods of attaining purposes, in general; and this, in turn, should spring from a still more general doctrine of the nature of teleological action, in general [2. 108].

Every consideration of method is thus by no means confined to speculative rhetoric, but on the contrary, it is only because various methods are developed by other sciences that speculative rhetoric as a study of methods in general is possible. Mathematics as independent of all other sciences of course develops its own methods; phenomenology needs only mathematics to aid in developing its peculiar method, and speculative grammar and critical logic can develop the pragmatic and inductive methods which are employed

by all the sciences of reality. General methodetic would then be an examination of all these methods as various prescriptions for kinds of teleological action.

There is no explicit treatment of speculative rhetoric in the Collected Papers, and the brief outline presented in the Minute Logic affords the clearest indication of how Peirce conceived what he called a year later (1903) "the highest and most living branch of logic" (2. 333). It will suffice for the present study merely to distinguish methodetic from objective logic without hazarding a guess as to what Peirce's development of the former subject might have been, and to examine the normative character of logic in light of these disciplines. After his sketch of speculative rhetoric or methodetic in the Minute Logic, Peirce opened the next section with the remarks:

With Speculative Rhetoric, Logic, in the sense of Normative Semeiotic, is brought to a close. But now we have to examine whether there be a doctrine of signs corresponding to Hegel's objective logic; that is to say, whether there be a life of signs, so that--the requisite vehicle being present--they will go through a certain order of development, and if so, whether this development be merely of such a nature that the same round of changes of form is described over and over again whatever be the matter of the thought or whether, in addition to such a repetitive order, there be also a greater life history that every symbol furnished with a vehicle of life goes through, and what is the nature of it [2. 111].

Peirce offers an apology to those who would "pooh-pooh an idea of this sort," but concludes:

if a reader who has thought it worth while to listen to what I have had to say upon normative logic finds objective logic too remote from his interests to care to listen to any discussion of it, I shall fully approve his allowing the leaves of my chapter upon this subject to remain uncut.

But my own position is different. It lies directly in the path of my duty to consider the question critically [2. 111].

Objective logic in Peirce's system seems best approached as the logical counterpart of objective idealism. Every general idea or concept is a symbol, and just as in the realm of mental action general ideas possess life and growth in accordance with the law of mind, so in the realm of overt action every vehicle of meaning (for example, a written or spoken word) which functions as a symbol possesses life and growth in accordance with a law of action. As Peirce remarked circa 1895: "A symbol, once in being, spreads among the peoples. In use and in experience, its meaning

grows. Such words as force, law, wealth, marriage, bear for us very different meanings from those they bore to our barbarous ancestors" (2. 302). There is, however, an important difference between objective idealism and objective logic. The former arose as an answer to the question whether reality is basically mental or material and was possible only upon the assumption which connected the two realms in the ontological line, namely, the assumption that reality is explicable. Since reality can be defined only with reference to a process of inquiry, any examination of the warrant for this assumption carries the analysis from a consideration of ontology to one of the nature of inquiry. Objective logic, on the contrary, arises from the question whether the vehicles of meaning through their representative function attain a real status as symbols. According to the sketch of this subject in the Minute Logic, "the mere hypothesis of such a thing as a symbol" "involves the idea of a different mode of being from that of existential fact" (2. 115). There is thus the curious circumstance that objective idealism begins with a question about the general character of reality and ends with one about the function of symbols (namely, whether induction is practically possible as a means of inquiry), while objective logic begins with a question about the function of symbols and ends with one about the general character of reality, namely, about modes of being.

Circularity is avoided only if the modes of being are independent of ontological principles, or in other words, if the determination of reality supplied by ontology does not in itself determine the modes of reality.¹ The assumption made by objective

¹Peirce's later writings interrelate modes of being, existence, and reality in three different ways: (1) In a statement of 1902, existence is a "special mode" of reality, and reality, a "special mode of being" (6. 349). (2) According to a discussion of realism, circa 1905, existence and reality are sharply distinguished with no indication that the former is a special mode of the latter. 5. 503. Cf. infra, pp. 182-83. (3) In a paper of 1906, possibility, actuality or existence, and law are given as three modes of reality. 4. 580. The rationale of this latter statement is given more fully in a piece circa 1903, "Divisions of Triadic Relations." 2. 233 ff.

These statements become consistent if "being" is taken as the most general term, having three modes corresponding to the categories. Possibility, existence, and reality as modes of being express a firstness, secondness, and thirdness, respectively. Existence simply as secondness is a purely "dynamical character" and is to be sharply distinguished from reality, which is the purely "cognitionary character" of being. 5. 503. However, reality as

idealism demanded that the categories afforded by phenomenology and logic supply principles of reality or being. Peirce now explains in his outline of objective logic that the categories in themselves do not determine modes of being.

One might antecedently expect that the cenopythagorean¹ categories would require three modes of being. But a little examination will show us that they could be brought into fairly presentable accordance with the theory that there were only two, or even only one. The question cannot be decided in that way. Besides, it would be illogical to rely upon the categories to decide so fundamental a question. The only safe way is to make an entirely fresh investigation [2. 116].

Accordingly, the meaning of metaphysical conceptions, especially that of being, must be reëxamined.

In such abstract questions, as we shall have already found, the first step, often more than half the battle, is to ascertain what we mean by the question--what we possibly can mean by it. We know already how we must proceed in order to determine what the meaning of the question is. Our sole guide must be the consideration of the use to which the answer is to be put--not necessarily the practical application, but in what way it is to subserve the summum bonum. This is true of any word. But that which is true of one word in one respect, of another in another, of every word in some or another respect, that is precisely what the word 'being' aims to express. There are other ways of conceiving Being--that it is that which manifests itself, that it is that which produces effects--which have to be considered, and their relations ascertained [2. 116].

It might seem offhand that Peirce has here for the moment forgotten his pragmatism and has himself lapsed into the "meaningless gibberish of ontological metaphysics" which he so roundly condemned three years later.² But even prima facie evidence is against such cavalier treatment of the passage. In the first place, the explicit emphasis on the question of meaning and the mention of "practical application" indicates that Peirce was still very

thirdness may itself be divided into three modes given by the divisions of triadic relations. In this latter sense, the third mode is that of a law, the second, that of an actual instance exemplifying the law, and the first, that of the "real possibility" of such exemplification. Cf. the discussion of "real possibility" in connection with Peirce's pragmatism, infra, chap. vii, sec. 2.

¹This list of categories may be distinguished from other lists as the Ceno-Pythagorean Categories, on account of their connection with numbers" (1902). 2. 87.

²Cf. supra, p. 135.

conscious of his pragmatism. Moreover, the Collected Papers contain frequent examples of self-criticism and it seems safe to assume that if Peirce had regarded his later denunciations of meaningless metaphysics as applying to some of his own writings, he would not have hesitated to say as much. On the contrary, passages like the above with references to the summum bonum tend to become more numerous rather than to disappear in his later writings.¹ It is therefore incumbent upon the commentator to search for an interpretation which explains such passages as outlining a fresh examination of metaphysical principles entirely in accord with the general philosophy of pragmatism, and only with the failure of this attempt is there justification for the conclusion that Peirce became inconsistent with his own pragmatism.

B. The outline of objective logic closes with two paragraphs immediately following the one in question, and it will be well to begin the search by quoting them in full.

Having thus worked out a tolerable conception of Being, we turn to modes of being. But these are metaphysical conceptions. Let us first inquire how the validity of any metaphysical conception is to be determined. For this purpose we have only to apply the principles of Speculative Rhetoric. We sketch out the method and apply it to a few metaphysical conceptions, such as Reality, Necessity, etc. In process of doing this, we discover that all such metaphysical conceptions are but determinations of the categories, and consequently form a regular system. We also find that they can be held as valid only in approximate and imperfect senses.

But this seems to be in conflict with our conception of Being, particularly as derived from the notion of a symbol; which, however, is solidly founded, too. We now begin to see the sense of talking of modes of being. They are elements of coöperation toward the summum bonum. The categories now come in to aid us materially, and we clearly make out three modes or factors of being, which we proceed to make clear to ourselves. Arrived at this point, we can construct a Weltanschauung. From this platform, ethics shines forth with all its native nobility. Common men carry this Weltanschauung in their breasts; and perhaps the pimp, the looting missionary, the Jay Gould, may, through the shadows of their degradation, catch now and then a purer glimpse of it, than the most earnest of citizens, the Cartises, the Emersons, the Bishop Myriels. It is beautifully universal; and one must acknowledge that there is something healthy in the philosophy of faith, with its resentment at logic as an impertinence. Only it is very infantile. Our final view of logic will exhibit it (on one side of it) as faith come to years of discretion [2. 117-18].

¹The passage quoted above contains the first appearance of the summum bonum as a basic concept of Peirce's system. For later appearances cf. 1. 575 (later in the Minute Logic), 1. 191 (1903), 5. 433 (1905), 1. 573 (1906).

If these paragraphs make anything clear, it is that Peirce's final examination of the principles of metaphysics and logic somehow requires an appeal to ideals of conduct and to a faith that springs from the human breast. Fortunately Peirce completed a part of the fourth chapter of the Minute Logic, which leaves no doubt concerning the general place of ethics in his system. He declares at the outset:

the intention of this chapter is to lay the foundation for the doctrine, which will appear more and more evident as we proceed, that that truth the conditions of which the logician endeavors to analyze, and which is the goal of the reasoner's aspirations, is nothing but a phase of the summum bonum which forms the subject of pure ethics, and that neither of those men can really understand himself until he perceives clearly that it is so. [l. 575].

This statement is followed by a discussion of traits of character necessary for scientists.

At the very lowest, a man must prefer the truth to his own interest and well-being and not merely to his bread and butter, and to his own vanity, too, if he is to do much in science. This will appear in the logical discussion; and it is thoroughly borne out by examining the characters of scientific men and of great heuristic students of all kinds [l. 576].

Peirce offers a résumé of biographical history to show that "excluding idle tales about pre-socratic philosophers, all history does not tell of a single man who has considerably increased human knowledge (unless theology be knowledge) having been proved a criminal" (l. 576).

This consideration is clearly a development of the conclusion necessitated by Peirce's analysis of probability and induction. The only means of attaining scientific knowledge is by true inductions, and if man is to inquire in accordance with the inductive method the ends of his actions must transcend personal interests and be identified with those of an unlimited community. Truth as the goal of scientific inquiry is thus a phase of the summum bonum, a phase of the final end of all human action. The crucial question, therefore, presupposed by the analysis of logic and science is "What is good?" Peirce explains,

Now this is hardly a normative question: it is pre-normative. It does not ask for the conditions of fulfillment of a definitely accepted purpose, but asks what is to be sought, not for a reason, but back of every reason. Logic, as a true normative science, supposes the question of what is to be aimed at to be already answered before it could itself have

been called into being. Pure ethics, philosophical ethics, is not normative, but pre-normative [1. 577].

This inquiry into the summum bonum, Peirce goes on to say, contains "the true life-germ of all the truths I have to unfold" (1. 578).

The determination of the ultimate end of all action, of "what is desirable without any reason," clearly cannot be given by any scientific analysis, since every such analysis presupposes this very determination. Consequently, "we must make up our minds to rely entirely upon self-questioning, with here and there perhaps some secondary aid from psychology" (1. 579). However,

such self-questioning produces no infallible response. On the contrary, consciousness may be set down as one of the most mendacious witnesses that ever was questioned. But it is the only witness there is; and all we can do is to put it in the sweat-box and torture the truth out of it, with such judgment as we can command [1. 580].

Accordingly, Peirce proposes

to pass in review every one of the general classes of objects which anybody could suppose to be an ultimate good, and to question consciousness, first as to whether or not each of these in turn could content us as the sole ultimate good independently of any ulterior result, and if not, whether it can be considered to be in itself a good at all, irrespective of its effects [1. 581].

Peirce never completed this undertaking and seems almost to have given up the idea of discovering the summum bonum by questioning consciousness. In his lectures on pragmatism (1903), which could have come but shortly after the above passage, he frankly admits:

It is only since 1883 that I have numbered ethics among my special studies; and until about four years ago, I was not prepared to affirm that ethics was a normative science. As for esthetics, although the first year of my study of philosophy¹ was devoted to this branch exclusively, yet I have since then so completely neglected it that I do not feel entitled to have any confident opinions about it. I am inclined to think that there is such a Normative Science; but I feel by no means sure even of that [5. 129].

In another lecture in this series, Peirce described himself as "a perfect ignoramus in esthetics" (5. 111).

Despite his uncertainty about esthetics, Peirce in these same lectures and in all his later writings on the subject made

¹Probably 1855, when Peirce in his 16th year read Schiller's Aesthetische Briefe. Cf. 2. 197.

this as the first of the normative sciences that upon which both ethics and logic are dependent. For "the logically good is simply a particular species of the morally good," and "the morally good appears as a particular species of the esthetically good" (5. 130). According to the sketch of esthetics given in the lecture, "there is no such thing as positive esthetic badness; and since by goodness we chiefly in this discussion mean merely the absence of badness, or faultlessness, there will be no such thing as esthetic goodness" (5. 132). Hence, "all there will be will be various esthetic qualities; that is, simple qualities of totalities not capable of full embodiment in the parts, which qualities may be more decided and strong in one case than in another . . . there are innumerable varieties of esthetic quality, but no purely esthetic grade of excellence."

The terms good and bad are thus introduced by ethics and arise from the circumstance that

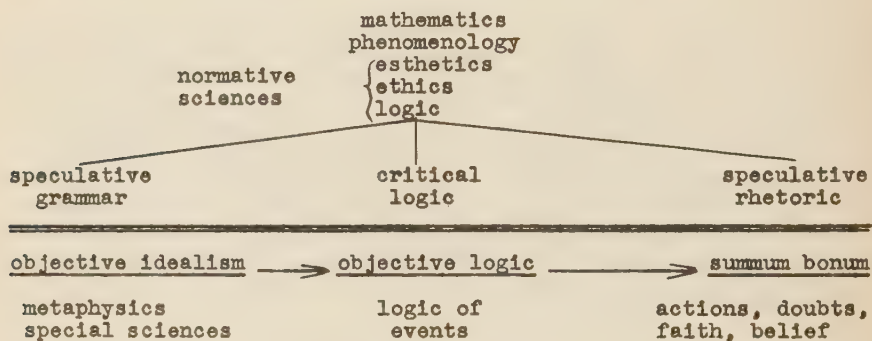
an aim which cannot be adopted and consistently pursued is a bad aim. It cannot properly be called an ultimate aim at all. The only moral evil is not to have an ultimate aim [5. 133]

Accordingly the problem of ethics is to ascertain what end is possible. It might be thoughtlessly supposed that special science could aid in this ascertainment. But that would rest on a misconception of the nature of an absolute aim, which is what would be pursued under all possible circumstances--that is, even though the contingent facts ascertained by special sciences were entirely different from what they are. Nor, on the other hand, must the definition of such aim be reduced to a mere formalism [5. 134].

C. Peirce's reflections on the normative sciences prior to logic remained vague and indefinite, and further citation would be of no help in determining the place of these sciences in his system. At least the general problem which led Peirce finally to an examination of esthetics and ethics is clear, even if the value of such examination for the resolution of the problem seems negligible. The analysis of the Search for a Method culminated in three parallel problems: to relate mathematical to empirical order or mind to nature, to justify induction, and to bring human actions into accord with the calculus of probabilities. The solution of the first problem presupposed that the second was settled, and the second in turn depended upon the resolution of the third for its termination. The only way of solving the third problem seemed to be by an article of faith concerning the ultimate end of human

action. This circumstance led to two paradoxes when the first and second problems were regarded as depending on faith for their ultimate resolution. Peirce's later analysis of these first two problems failed to find any means for their termination independently of an appeal to the solution of the third problem. Consequently, the necessity for basing science and philosophy upon an article of faith, with the inevitable paradoxes arising from this necessity, can only be avoided by the discovery of a satisfactory determination of the ultimate goal of human action arising from the very nature of actions and the ends of action without the need for unquestioned faith. Esthetics and ethics as analyses independent of logic, metaphysics, and the special sciences would provide the only possibility of securing this release from faith and paradoxes.

In these terms, Peirce's system of philosophy may be schematized conveniently by the following diagram.



The double line divides the system into two realms. The upper realm provides the definition of reality and the necessary conditions for inquiry into reality, while the lower realm contains the empirical universe which supplies the basis for positive truths about reality, general or special. The central problem of the system becomes that of connecting the two realms, since truths about reality are possible only when this empirical universe is brought into conformity with the determination of reality afforded by the upper realm. The three branches of logic divide this problem into three phases.

Speculative grammar as the source of the necessary principles of significant assertion raises the problem directly in terms of the nature of reality or of things signified: if it is

assumed that these regulative principles afford constitutive truths of reality, objective idealism becomes the one intelligible theory of the empirical universe and all the sciences of reality may be arranged in a single line with respect to the abstractness of their objects. However, the assumption which gives rise to objective idealism presupposes that there is objective logic, namely, that the empirical universe is rational or that there is a logic of events. In the only extensive treatment of objective logic in the Collected Papers, Peirce argues that this logic must be "that of the inductive or hypothetic inference" (6. 218). Critical logic with its analysis of probable inference thus stands to objective logic as speculative grammar to objective idealism. But the assumption that the logic of events is the logic of induction demands that there be a mode of reality corresponding to symbols or laws which is different from that of existential fact. Since the demonstration of the validity of induction is purely mathematical and makes no reference to the actual character of the universe, it cannot justify this demand. Yet, if induction is practically possible as a procedure of inquiry, the reality of laws or symbols is sufficiently accounted for because the objective or real probabilities determined by induction are precisely what is meant by laws.

The final phase of the problem is thus that of bringing human actions into accord with the calculus of probabilities, and considered only in terms of logic, this assumes that the principles of speculative rhetoric, as principles of teleological action, do in fact govern human action, just as the principles of speculative grammar are assumed to be principles of things and those of critical logic, to be principles of events. But this is possible only if truth, or the ascertainment of objective probabilities, is part of the summum bonum, or of the ultimate end of human action. Objective idealism, then, begins with a question about the general character of reality and is carried inevitably to objective logic with a question about the function of symbols; this latter analysis in turn is led to an examination of the ultimate goal of human action which supplies the final determination of reality. The two realms of Peirce's system are thus connected ultimately by an analysis of the summum bonum, since the empirical universe is determined as reality only when the ultimate end of action is shown to include the attainment of true inductions.

Despite the incompleteness of Peirce's account of esthetics and ethics, his remarks on these sciences provide some indication of the possibilities they afford for the resolution of the paradoxes in his system. The phenomenological analysis of the categories shows that "not only does Thirdness suppose and involve the ideas of Secondness and Firstness, but never will it be possible to find any Secondness or Firstness in the phenomenon that is not accompanied by Thirdness" (5. 90). Hence, although esthetics is concerned primarily with qualities of feeling it also involves an intellectual element. Peirce declared:

ignorant as I am of Art, I have a fair share of capacity for esthetic enjoyment; and it seems to me that while in esthetic enjoyment we attend to the totality of Feeling--and especially to the total resultant Quality of Feeling present in the work of art we are contemplating--yet it is a sort of intellectual sympathy, a sense that here is a Feeling that one can comprehend, a reasonable Feeling. I do not succeed in saying exactly what it is, but it is a consciousness belonging to the category of Representation, though representing something in the Category of Quality of Feeling [5. 113].

Because of this intellectual element in esthetics, "to say that morality, in the last resort, comes to an esthetic judgment is not hedonism--but is directly opposed to hedonism" (5. 111). Just as esthetic consciousness constitutes a representation of firstness, moral or ethical consciousness constitutes a representation of secondness: "every pronouncement between Good and Bad certainly comes under Category the Second; and for that reason such pronouncement comes out in the voice of conscience with an absoluteness of duality which we do not find even in logic . . ." (5. 111).

Esthetics and ethics for Peirce, then, would comprise inquiries into the elements of feeling and conscience contained in the ultimate ends of human action, and such inquiries are possible only because an aspect of intelligibility is present in both kinds of elements. Since a man pursues the inductive method because he is inclined by his feelings and commanded by his conscience to do so rather than simply because he understands a logical exposition of the method, esthetics and ethics are precisely the studies which determine whether or not induction is practically possible as a mode of inquiry. It is only when truth is shown by an analysis of feelings and dictates of conscience to be a natural end of human action that there can be any assurance that the one method

logically capable of obtaining truth will prevail in the long run in human inquiry. The paradoxes in question obviously break out again if it is maintained that esthetics and ethics are inquiries which themselves presuppose the account of truth and reality given by logic. Yet, this attempt to find in esthetics and ethics the ultimate basis for any determination of truth and reality does afford a dialectical answer to these paradoxes. For the assertion of either paradox may now be shown to assume that the normative sciences prior to logic must presuppose the definition of reality and the rules for obtaining truth given by logic, or in other words, that the sciences which supply the presuppositions of induction are themselves inductive sciences. Inasmuch as such an assumption contradicts Peirce's architectonic of the sciences, his system is saved from internal inconsistency.

In the final systematization of Peirce's philosophy any determination of truth and reality is thus dependent on the esthetic and ethical observations of the summum bonum rather than paradoxically on the inductive observations which test the belief that intellectual inquiry can be indefinitely prolonged. It is doubtful, however, whether this appeal to the noninductive albeit "scientific" observations of esthetics and ethics provides an alternative to an appeal to unquestioned faith. For the results of such observations would seem indistinguishable from a kind of self-consciousness of one's faith concerning the summum bonum, and perhaps this is what Peirce had in mind when he spoke of "faith come to years of discretion." Since mathematics is architectonically prior to esthetics and ethics, there would be a sense in which the observations in these latter sciences could employ the mathematics of induction (as in the questioning of conscience), although such employment would not constitute induction in the logical sense of inquiry into reality. The summum bonum represents "what is to be sought, not for a reason, but back of every reason," or in other words, it is itself the ultimate reason for every inquiry, and while it is thus not directly subject to inquiry but is always presupposed, it can be exhibited as the result of self-observation regarding the elements of feeling and conscience underlying any deliberate pursuit of truth and reality. The circumstance that such elements regarded in themselves possess a proper intelligibility and hence in some sense fall under the forms of mathematics provides the only justification for the claim that

the self-consciousness of faith resulting from esthetics and ethics constitutes a form of scientific knowledge. That is to say, the intrinsic thirdness in feeling and conscience affords a kind of objectivity or non-arbitrariness (analogous to that achieved in mathematics and phenomenology) which is presupposed in the final objectivity designated by the definition of reality.

This systematization of Peirce's philosophy in terms of an esthetic and ethical determination of the summum bonum would seem closely connected with his insistence that pragmatism must be "based . . . upon a study of that experience of the phenomena of self-control which is common to all grown men and women. It is to conceptions of deliberate conduct that Pragmaticism would trace the intellectual purport of symbols, and deliberate conduct is self-controlled conduct" (5. 442). An examination of the crucial role played by the pragmatic criterion of meaning in the final form of Peirce's system will be the task of the next chapter.

CHAPTER VI

PEIRCE'S SYSTEM AS PRAGMATIC PHILOSOPHY

The lectures on pragmatism, 1903, and the two articles in The Monist, 1905, afford the most extensive treatment of Peirce's pragmatism in the context of a system of philosophy. Since the general outline of Peirce's system presented in these writings has been treated in large part in the preceding chapter, the present study will presuppose this outline and will concentrate on an examination of the statements which indicate the place and importance of pragmatism in the system. Peirce's later unpublished writings on pragmatism will provide valuable supplementation.

1. Pragmatism and Perceptual Judgments

A. Peirce concluded his lectures on pragmatism with the statement of a "maxim" for the pragmatic logician: "The elements of every concept enter into logical thought at the gate of perception and make their exit at the gate of purposive action; and whatever cannot show its pass ports at those two gates is to be arrested as unauthorized by reason" (5. 212). This at once suggests comparison with the assertion made in the original presentation of the categories (1867) that the concepts substance and being denote, respectively, "the beginning and end of all conception."¹ These two ontological concepts disappeared from all subsequent enumeration of the categories since the logic of relatives showed that the important formal elements were expressed by the process of logical operations, irrespective of whether, in terms of traditional logic, the process was regarded as passing from subject to predicate (substance to being) or from premiss to conclusion. In the final systematization of Peirce's philosophy the discovery and examination of the categories required only the simplest mathematics (formal logic) and phenomenology, while pragmatism as a maxim of speculative grammar was essentially connected with the nature of

¹Cf. supra, p. 26.

assertion. Viewed architectonically, the problem of how to make ideas clear presupposes a determination of the categories and of the ideals of conduct, and is concerned properly with the conditions for significant assertion about reality. Pragmatism, then, is precisely that part of Peirce's fully developed system which takes over his early problem of connecting assertion and reality, namely, of relating subject and predicate to substance and being. The fact that these two ontological terms as designating the beginning and end of conception are replaced, respectively, by perception and purposive action may be taken as indicative of the circumstance that the two realms in Peirce's system (the realms of conception and appearance and that of fact and reality) cannot be connected directly through the ontological line but require a reference to ultimate ends of action.

The most important aspect for pragmatism about the passage from perception to purposive action is the fact that the process is essentially one subject to self-control. In Lecture V, "Three Kinds of Goodness," Peirce explained: "Just at this point we begin to get upon the trail of the secret of pragmatism A logical reasoner is a reasoner who exercises great self-control in his intellectual operations; and therefore the logically good is simply a particular species of the morally good" (5. 130). However, if reality is something independent of individual choice there must be a part of the process which cannot be controlled by the reasoner. Peirce begins his examination of perception in Lecture IV by asking:

Where then in the process of cognition does the possibility of controlling it begin? Certainly not before the percept is formed. Even after the percept is formed there is an operation which seems to me to be quite uncontrollable. It is that of judging what it is that the person perceives Consequently, until I am better advised, I shall consider the perceptual judgment to be utterly beyond control. Should I be wrong in this, the percept, at all events, would seem to be so [5. 115] [cf. 4. 540, 1905].

It follows, then, that our perceptual judgments are the first premisses of all our reasonings and that they cannot be called in question. All our other judgments are so many theories whose only justification is that they have been and will be borne out by perceptual judgments [5. 116].

While perceptual judgments may always be first premisses relative to human reasoning, they clearly are not so in an absolute sense since

what is first for us is not first in nature. The premisses of Nature's own process are all the independent uncaused elements of facts that go to make up the variety of nature which the necessitarian supposes to have been all in existence from the foundation of the world, but which the Tychist supposes are continually receiving new accretions. These premisses of nature, however, though they are not the perceptual facts that are premisses to us, nevertheless must resemble them in being premisses. We can only imagine what they are by comparing them with the premisses for us. As premisses they must involve qualities [5. 119].

Peirce's objective idealism and objective logic of course demand this view of first premisses in nature. The "universe is a vast representamen, a great symbol of God's purpose, working out its conclusions in living realities" (5. 119). But inasmuch as any characterization of the universe is possible only by analogy from what are first premisses for us, the examination of perceptual judgments as the beginnings of processes which, once started, are subject to self-control and end in purposive action will reveal indispensable presuppositions of all cosmology and natural science.

Although perceptual judgments may be beyond control, the new analysis of the subject and predicate of a proposition afforded by the logic of relatives shows that these judgments none the less involve generality. Peirce opens Lecture VI by explaining that

the Logic of Relations has now reduced logic to order, and it is seen that a proposition may have any number of subjects but can have but one predicate which is invariably general. Such a proposition as 'Tully is Cicero' predicates the general relation of identity of Tully and Cicero. Consequently, it is now clear that if there be any perceptual judgment, or proposition directly expressive of and resulting from the quality of a present percept, or sense-image, that judgment must involve generality in its predicate [5. 151].

Peirce's early doctrine that cognition begins with the manifold of substance is now made consonant with his later views of continuity and the logic of relatives.

That which is not general is singular; and the singular is that which reacts. The being of a singular may consist in the being of other singulars which are its parts . . . every proposition whatsoever refers as to its subject to a singular actually reacting upon the utterer of it and actually reacting upon the interpreter of it. All propositions relate to the same ever-reacting singular; namely, to the totality of all real objects [5. 152].

Even in the case of propositions referring to fictitious characters, "it becomes a real fact that" an author has imagined his heroine in a certain way, "which fact he cannot destroy by pretend-

ing or thinking that he imagined her to be otherwise" (5. 152).

Moreover,

it is a characteristic of perceptual judgments that each of them relates to some singular to which no other proposition relates directly, but, if it relates to it at all, does so by relating to that perceptual judgment. When we express a proposition in words, we leave most of its singular subjects unexpressed; for the circumstances of the enunciation sufficiently show what subject is intended and words, owing to their usual generality, are not well adapted to designating singulars [5. 153].

When the subject of a proposition is not singular, it must be either indesignative, meaning that some singular or other "might replace this subject while the truth was preserved, while failing to designate what singular this is," or else hypothetical, meaning that any singular which fulfills certain conditions may be substituted for the subject, "without guaranteeing that there is any singular which fulfills these conditions" (5. 154).

Every perceptual judgment thus uniquely determines a singular, and every proposition relates ultimately to one or more such singulars. This analysis is in perfect agreement with the principle of continuity because every singular may itself be taken as made up of singulars. "Thus heaven and earth is a singular; and its being consists in the being of heaven and the being of earth, each of which reacts and is therefore a singular forming a part of heaven and earth" (5. 152). Similarly, of course, the earth may be regarded as consisting of singulars, for example, the two hemispheres. The totality of all real objects may also be taken as a singular, and it possesses the unique characteristic of being the one singular to which all propositions are related. Thus, while every perceptual judgment determines a singular, the converse does not hold. There is obviously no single perceptual judgment determining the totality of all real objects, so that operations other than perception may determine a singular, although singulars so determined can always be analyzed as composed of singulars which are determined by perceptual judgments. No universal (namely, hypothetical) proposition can be a perceptual judgment because it always fails to give a unique determination of a singular (namely, an existent); every perceptual judgment is simply "the cognitive product of a reaction" (5. 156). Every cognition, then, begins with the manifold of substance in that a reaction (fact, event, or substance) which is singular relative to the percept it

produces is always necessary in order to start a process of cognition.

An existent or singular, however, is only the beginning of a perceptual judgment, just as a perceptual judgment is itself only the beginning of a process which ends in purposive action. The unity of being, which when added to the manifold of substance completes the perceptual judgment, is possible because every such judgment "must involve generality in its predicate." Because of this generality in the perceptual judgment, "the presumption is that a universal proposition can be necessarily deduced from it" (5. 156). After cautioning that in saying this he "certainly never intended to be understood as enunciating any proposition in psychology" (5. 157), Peirce gives an illustration of such deduction from purely logical considerations. In the case of the judgment that "one event C appears to be subsequent to another event A," since this can only be inferred from "judgments of the same description" and since "it does not seem possible that I can have performed an infinite series of acts of criticism each of which must require a distinct effort," "it therefore appears that I must have made some judgment that one event appeared to be subsequent to another without that judgment having been inferred from any premiss [namely] without any controlled and criticized action of reasoning" (5. 157). But then from the general element in this perceptual judgment, namely, from what is "implied in the meaning of subsequence, concerning which there is no room for doubt, it easily follows that whatever is subsequent to C is subsequent to anything, A, to which C is subsequent--which is a universal proposition" (5. 157).

Peirce concludes this section of his lecture with the statement, "Thirdness pours in upon us through every avenue of sense" (5. 157). It is indeed noteworthy that the process which starts with a percept arising from reaction with a singular and ends in predicating of that percept as of a subject something involving generality reflects all the important elements of Peirce's system. In the next section of the lecture Peirce explained "the validity of induction" and "the support of pragmatism" as resting on "the necessary relation between the general and the singular."¹ While this relation may be explained mathematically as implying merely that single members of an endless series necessarily express

¹Cf. supra, p. 153.

a general law of succession,¹ precisely the same relation is expressed in a perceptual judgment.

According to a summary of this matter given in Lecture VII,

perceptual judgments contain general elements, so that universal propositions are deducible from them in the manner in which the logic of relations shows that particular propositions usually, not to say invariably, allow universal propositions to be necessarily inferred from them [5. 181].

The example of such inference which Peirce offered in Lecture VI is taken from a proposition in which one subject is indesignative (namely, particular) and the other, hypothetical (namely, universal). It of course makes a difference which subject comes first, and "if the first general subject is indesignate, the proposition is called particular," while if it is hypothetical, "the proposition is called universal" (5. 155). Hence, "there is some woman whom any Catholic you can find will adore" is a particular proposition, and from it "we can with certainty infer the universal proposition that 'any Catholic you can find will adore some woman or other'" (5. 156).

The perceptual judgment "A appears subsequent to C" may thus be analyzed as implying "there appears to be an event A to which any event appears subsequent which appears subsequent to C," and from this we may infer with certainty the universal proposition "whatever appears subsequent to C appears subsequent to anything A, to which C appears subsequent." Similarly, "this percept is red" implies "this percept has the same color as any red percept," and hence, "any red percept has the same color as this percept." In these two examples, "the necessary relation between the general and the singular" lies in the fact that the singular propositions involve the predication of a transitive relation ("subsequent to" or "having the same color as") which gives the law of an endless series (namely, the series of events appearing subsequent to a given event or the series of percepts having the same color as a given percept).²

¹Cf. supra, p. 153.

²This analysis of the relation between the universal and the singular bears certain similarities to Bertrand Russell's principle of abstraction. Cf., for example, the latter's Principles of Mathematics, pp. 219-20. There is the important difference, however, that for Russell the relation must be symmetrical as well as transitive while for Peirce it suffices if it is

B. Peirce could thus assert that "every general form of putting concepts together is, in its elements, given in perception" (5. 186). He began the seventh and last lecture by enumerating three propositions which, he declared, "seem to me to give to pragmatism its peculiar character" (5. 180). (1) "Nihil est in intellectu quod non prius fuerit in sensu" (nothing is in the intellect which was not previously in sensation), where intellectus means "the meaning of any representation in any kind of cognition, virtual, symbolic, or whatever it may be," and in sensu is taken "in the sense of in a perceptual judgment; the starting point or first premiss of all critical and controlled thinking." (2) "Perceptual judgments contain general elements, so that universal propositions are deducible from them" (3) "Abductive inference shades into perceptual judgment without any sharp line of demarcation between them; or, in other words, our first premisses, the perceptual judgments, are to be regarded as an extreme case of abductive inferences, from which they differ in being absolutely beyond criticism" (5. 181).

This third proposition is tantamount to the assertion that the process of forming a perceptual judgment is essentially the same as that of forming an hypothesis.

The only symptom by which the two can be distinguished is that we cannot form the least conception of what it would be to deny the perceptual judgment. If I judge a perceptual image to be red, I can conceive of another man's not having that same percept But that any man should have a percept similar to mine and should ask himself the question whether this percept be red, which would imply that he had already judged some percept to be red, and that upon careful attention to this percept, pronounce it to be decidedly and clearly not red,

transitive. This difference arises in part at least from the fact that for Russell the problem is to explain an abstraction such as redness when only individuals are assumed to be real, namely, the abstraction must be reduced to a relation between individuals. In such a case the relation must be more than merely transitive. For Peirce, on the contrary, the problem is to relate the individual and the universal when absolutely determinate individuals are assumed to have no reality. The essential characteristic of the relation then becomes merely that it be such as to permit an inference; the reality of the singular is explained by the fact that it implies a general. Since any transitive relation will permit an inference, it would be incorrect to maintain that the relation must also be symmetrical.

This difference between Russell and Peirce reflects the former's atomism and nominalism as opposed to the latter's realism.

when I judge it to be prominently red, that I cannot comprehend at all. An abductive suggestion, however, is something whose truth can be questioned or even denied [5. 186].

Yet this test of inconceivability cannot be made the basis of an absolute distinction. "That which is inconceivable to us today, may prove tomorrow to be conceivable and even probable; so that we never can be absolutely sure that a judgment is perceptual and not abductive" (5. 187).

The continuity between perceptual judgments and abductive inferences is of extreme importance for Peirce's entire system; for if hypotheses could be necessarily deduced from indubitable perceptions and there was no danger of mistaking them for the latter, both the logic of hypotheses and the logic of induction would be superfluous. It is only because one might be wrong in regarding "this percept has the same color as any red percept" as an indubitable premiss that the universal judgment following from it must be examined as a meaningful hypothesis and tested by induction. The certainty that induction in the long run will discover the truth is the only sure way of counteracting the uncertainty that the premisses of a given hypothesis are indubitable perceptions.

Abduction as that process of logical inference which shades into the process of asserting a perceptual judgment is the one type of inference in critical logic which is directly connected with pragmatism and the analysis of significant assertion.

If you carefully consider the question of pragmatism you will see that it is nothing else than the question of the logic of abduction. That is, pragmatism proposes a certain maxim which, if sound, must render needless any further rule as to the admissibility of hypotheses to rank as hypotheses, that is to say, as explanations of phenomena held as hopeful suggestions; and, furthermore, this is all that the maxim of pragmatism really pretends to do, at least so far as it is confined to logic, and is not understood as a proposition in psychology. . . . But that pragmatism cannot interfere with induction is evident; because induction simply teaches us what we have to expect as a result of experimentation, and it is plain that any such expectation may conceivably concern practical conduct. In a certain sense it must affect deduction. Anything which gives a rule to abduction and so puts a limit upon admissible hypotheses will cut down the premisses of deduction, and thereby will render a reductio ad absurdum and other equivalent forms of deduction possible which would not otherwise have been possible.

But

to affect the premisses of deduction is not to affect the logic of deduction [5. 196].

Pragmatism is thus to supply the logic of abduction with a determination of the "goodness" or "end of an explanatory hypothesis." This end is, "through subjection to the test of experiment, to lead to the avoidance of all surprise and to the establishment of a habit of positive expectation that shall not be disappointed" (5. 197). An analysis of the logical interrelations of belief, expectation, and judgment is hence a crucial task for pragmatism. In a fragment entitled "Belief and Judgment," circa 1902, Peirce speaks at the outset as if "of theoretical beliefs, in so far as they are not practical, we may distinguish between those which are expectations, and those which are not even that" (5. 539). However, it would seem that Peirce meant this statement to apply to theoretical beliefs only when their meaning has been incompletely analyzed, and he seems, three pages later, to retract the statement when he declares: "It now begins to look strongly as if perhaps all belief might involve expectation as its essence. That is as much as can justly be said. We have no assurance that this is true of every kind of belief" (5. 542).

Peirce offers the following as an illustration of the way in which purely theoretical beliefs seem to involve expectation.

To say that a quadratic equation which has no real root has two different imaginary roots does not sound as if it could have any relation to experience. Yet it is strictly expectative. It states what would be expectable if we had to deal with quantities expressing the relations between objects, related to one another like the points of the plane of imaginary quantity. So a belief about the incommensurability of the diagonal relates to what is expectable for a person dealing with fractions; although it means nothing at all in regard to what could be expected in physical measurements, which are, of their very nature, approximate only.

This analysis is possible, of course, only because Peirce has previously explained all mathematical reasoning as the observation of diagrams or imaginary constructions.¹

At the opposite extreme to abstract theoretical beliefs lie the beliefs in perceptual judgments. In the case of a judgment like "That wafer looks red," "What element of expectation is there in the belief that the wafer looks red at this moment? In order to handle this question, it is necessary to draw a distinction. Every proposition has its predicate which expresses what is believed, and its subjects which express of what it is believed"

¹Cf. supra, pp. 139-40.

(5. 542). But then the judgment "this wafer looks red" expresses a belief that a given subject has a certain appearance.

It takes some time to write this sentence, to utter it, or even to think it. It must refer to the state of the percept at the time that it, the judgment, began to be made. But the judgment does not exist until it is completely made. It thus only refers to a memory of the past; and all memory is possibly fallible and subject to criticism and control. The judgment, then, can only mean that so far as the character of the percept can ever be ascertained, it will be ascertained that the wafer looked red [5. 544].

Peirce remarks that "perhaps the matter may be stated less paradoxically" by appealing to the fact that every singular judgment involves a law. For "to say that a body is hard, or red, or heavy, or of a given weight, or has any other property, is to say that it is subject to law and therefore is a statement referring to the future" (5. 545). That is, in terms of the logic of relatives, "This wafer looks red" predicates of this singular the general relation "having the same color as," which gives rise to the law "any red object will appear to have the same color as this wafer appeared to have."

Peirce's synechistic view of mind, which holds that "we are immediately conscious through an infinitesimal interval of time,"¹ permits the statement that relative to expectation and belief perceptual judgments involve memory and control, while in respect to their character as premisses of reasoning they are beyond control. Thus, the perceptual judgment "this wafer appears to have the same color as any red object" occurs in an infinitesimal interval of consciousness and as such is an uncontrollable first premiss. However, by the principle of continuity, just as an infinitesimal interval of consciousness shades into a very small positive interval, so this judgment shades into the law or positive belief that "any red object will appear to have the same color as this wafer appeared to have." It is permissible, therefore, to assert that the beliefs arising directly from perceptual judgments provide no exception to the general principle that every belief involves expectation as its essence, and at the same time to hold that perceptual judgments as immediate consciousness are uncontrollable.

¹Cf. supra, p. 118.

2. Critical Common-Sensism and Realism

A. In the beginning of the second article in The Monist, 1905, Peirce made the statement: "Two doctrines that were defended by the writer nine years before the formulation of pragmatism may be treated as consequences of the latter belief. One of these may be called Critical Common-sensism" (5. 439). The other doctrine, treated later in the article, is specified as "the scholastic doctrine of realism" (5. 453). The reference to "nine years before", is undoubtedly to the papers of 1868-69 in the Journal of Speculative Philosophy.

Critical common-sensism is essentially a means of explaining the function of perceptual judgments as first premisses of reasoning. Peirce enumerates, in the article mentioned, "six distinctive characters" of this doctrine which may be summarized briefly as follows. (1) "Critical Common-sensism admits that there not only are indubitable propositions but also that there are indubitable inferences" (5. 440). For

if the reasoner is conscious, even vaguely, of what his guiding principle is, his reasoning should be called a logical argumentation. There are, however, cases in which we are conscious that a belief has been determined by another given belief, but are not conscious that it proceeds on any general principle. Such is St. Augustine's 'cogito, ergo sum.' Such a process should be called, not a reasoning, but an acritical inference. Again, there are cases in which one belief is determined by another, without our being at all aware of it. These should be called associational suggestions of belief [5. 441].

(2) Peirce thought at first that "the indubitable propositions changed with a thinking man from year to year," but inasmuch as subsequent study showed that "the changes are so slight from generation to generation, though not imperceptible even in that short period," he finally owned "his adhesion, under inevitable modification," to the view of the Scotch philosophers that it would be possible "to draw up a complete list of the original beliefs," which list "would hold good for the minds of all men from Adam down" (5. 444). (3) Original beliefs and acritical inferences are "of the general nature of instinct," and "as soon as we find that a belief shows symptoms of being instinctive, although it may seem to be dubitable, we must suspect that experiment would show that it is not really so" (5. 445).

(4) "By all odds the most distinctive character of the

Critical Common-sensist, in contrast to the old Scotch philosopher, lies in his insistence that the acritically indubitable is invariably vague" (5. 446). Vagueness is

the antithetical analogue of generality. A sign is objectively general, in so far as, leaving its effective interpretation indeterminate, it surrenders to the interpreter the right of completing the determination for himself A sign is more or less indeterminate, it reserves for some other possible sign or experience the function of completing the determination [5. 505].

In other words

every utterance naturally leaves the right of further exposition in the utterer; and therefore, in so far as a sign is indeterminate, it is vague, unless it is expressly or by a well-understood convention rendered general [5. 448].

Thus, "any red percept has the same color as this percept" means that the interpreter has nothing to do but to select any red percept he chooses in order to know the color of the percept in question, while "this percept has the same color as any red percept" leaves to the utterer the right of indicating further what percept is in question. Perceptual judgments as uncontrolled and indubitable first premisses inevitably involve this sort of vagueness or relativity to the utterer because generality requires a controlled act whereby the utterer surrenders to the interpreter the right of completing the determination of the subject. Inasmuch as this analysis of vagueness follows directly from an application of the logic of relatives, it might justly be called "the most distinctive character" of Peirce's common-sensism.

(5) The value of doubt, provided it be genuine, is a further characteristic of critical common-sensism. There can never be an absolutely sure determination of an indubitable belief, and "a plan for attaining to doubt," if rigorously pursued, is an indispensable check against such uncertainty (5. 451). (6) Finally,

critical common-sensism may fairly lay claim to this title for two sorts of reasons; namely, that on the one hand it subjects four opinions to rigid criticism: its own; that of the Scotch school; that of those who base logic or metaphysics on psychology or any other special science, the least tenable of all the philosophical opinions that have any vogue; and that of Kant; while on the other hand it has besides some claim to be called Critical from the fact that it is but a modification of Kantism [5. 452].

B. Since perceptual judgment shades into abductive inference, and thus into belief and expectation, the process of perception may itself be taken as expressing the process which begins with perception and ends in purposive action. The perceptual judgment "this percept is red" may, by virtue of the principle of continuity, be analyzed into the following two elements: (a) the uncontrolled, "vague," and indubitable first premiss "this percept has the same color as any red percept"; (b) the controlled abductive inference or hypothesis "any red percept will have the same color as this percept had." This second element is controlled in that it is formed with a conscious reference to the future and requires memory. Because of this reference it assumes the form of an expectation, and hence possesses "a capability of having a bearing upon conduct," a fact which "will lend it intellectual purport" (cf. 5. 548). It is thus a concept or general idea testable by induction and formed by purposive action, namely, consciously formed with a view to some possible affect on conduct.

In these terms, Peirce's scholastic realism may be explained as arising from the circumstance that the being of the singular subject of a perceptual judgment necessarily becomes general in the very process of understanding the judgment. The subject of "this percept is red" has singular being only when the judgment is analyzed exclusively with respect to that phase of the process of cognition which consists of reaction. The quality red, by virtue of being what it is in itself as a firstness, is accompanied by a feeling of givenness, a feeling that it is just as it appears irrespective of any control or conscious activity (cf. 4. 541). Such a feeling may be called a sense of reaction in that its uncontrollable character involves an awareness of something other than consciousness, and it is precisely this feeling that makes the quality unique and singular. However, this analysis of the being of a perceptual judgment is obviously incomplete until the element of thirdness has been added to the firstness and secondness; for both the feeling of a quality as such and the feeling of it as something beyond control are equally unintelligible (cf. 5. 49). A quality rendered intelligible is a quality compared with other qualities with which it has something in common, so that the judgment becomes "this percept has the same color as any red percept." While this permits the being of the subject to be understood by means of a general predicate rather than felt, it still

leaves its complete determination vague. But the vagueness can only be avoided by making the subject general, so that the judgment becomes the expectation "any red percept will have the same color as this percept had."

The generality of the subject which renders its being completely intelligible is also its reality as opposed to its existence or singularity. For "reality means a certain kind of non-dependence upon thought, and so is a cognitionary character, while existence means reaction with the environment, and so is a dynamic character" (5. 503). That is, since "an existing thing is simply a blind reacting thing, to which not merely all generality, but even all representation, is utterly foreign," a thing is understood (is represented) to have a nondependence upon thought by virtue of something quite different from its existence. Existence, then, can be felt in the present but can only be understood as past, so that "when we say that we know that some state of things exists, we mean that it used to exist, whether just long enough for the news to reach the brain and be retransmitted to tongue or pen, or longer ago" (5. 460). However, inasmuch as intelligibility or intellectual purport, in contrast to feeling, is the result of controlled or conscious activity, which essentially involves a purpose, its very nature entails a reference to the future as well as to the past (cf. 5. 461). Thus, the complete understanding of a red percept as something independent of thought (as having a being) consists in the general idea that if ever in the future we encounter a red percept, then regardless of what we may think about it, that percept will have the same color as the percept in question had. Peirce's scholastic realism, therefore, is simply the doctrine that the being of a percept can only be understood (as opposed to being felt) when it is regarded as an esse in futuro, namely, when it is regarded as general.

3. Pragmatism and Purposive Action

A. To say that the process of forming a general idea or expectation from a perceptual judgment is controlled is to imply that it is directed toward an end or purpose. While every general idea is specifically connected with an end peculiar to the situation in which it arose, if this were the only sense in which it involves an end it would be impossible to speak of reality. For an end in this sense being nothing but the satisfaction of an

individual desire is always dependent upon thought and opinion. For example, by virtue of being in a certain situation a person might be motivated by a strong religious desire to form the belief that "only a red object placed before the altar will appear to have the same color as this white wafer appeared to have while it was resting before the altar." Such a person would be disposed to regard the fact that the wafer actually did appear red while it rested before the altar as sufficient confirmation of his belief. However, if the inquiry were pushed further it might be discovered that the conditions were such that bright sunlight shining through a stained glass window at a certain time of day would make any object of a certain size which was placed where the wafer had been placed appear red, irrespective of its natural color. If the person in question were motivated by a purpose which transcended the satisfaction of his personal desire, he would not stop the inquiry as soon as it seemed to satisfy the conditions of his belief. As long as the end of inquiry, then, is merely the satisfaction of a desire arising from a particular situation, there can be no assurance that the outcome will be independent of individual thought and opinion. It is only when the inquirer sacrifices all personal interest and identifies his inquiry with that of an unlimited community that the final outcome is sure to be an opinion which coincides with reality and gains independence from individual thought. But then the end of every inquiry must be truth and not the satisfaction of individual desires.

The process of forming an opinion which will coincide with reality and be independent of the peculiarities of thought occasioned by a particular situation is thus perfectly analogous to the process of forming moral habits which will coincide with ethical goodness and be independent of accidental circumstances.

Just as conduct controlled by ethical reason tends toward fixing certain habits of conduct, the nature of which (as to illustrate the meaning, peaceable habits and not quarrelsome habits) does not depend upon any accidental circumstances, and in that sense may be said to be destined; so, thought, controlled by a rational experimental logic, tends to the fixation of certain opinions, equally destined, the nature of which will be the same in the end, however the perversity of thought of whole generations may cause the postponement of the ultimate fixation [5. 430].

It is precisely because of this analogy between the act of forming good habits and the act of forming true opinions that

Peirce regarded truth as synonymous with "logical goodness" (5. 142) and as a phase of the summum bonum.¹ Since actions are explicable only in terms of ends, the summum bonum or ultimate end is clearly not to be defined as an action of any sort but rather as a presupposition of all action. Hence, in respect to logical goodness, "the pragmatist"² does not make the summum bonum to consist in action, but makes it to consist in that process of evolution whereby the existent comes more and more to embody those generals which were just now said to be destined, which is what we strive to express in calling them reasonable" (5. 433). In other words, logical goodness is identical with inquiry properly conducted, which may be described as that process whereby rational beings come more and more to understand (to represent) the being of their experience in terms of general laws rather than merely to feel it by reaction with existents or singulars. This process itself is of course part of the development of the universe and as such is correctly called a kind of evolution. Since the process, moreover, must always be one of induction, it is destined in the long run to discover general laws which actually make the universe reasonable or understandable.

B. While inquiry clearly involves action in the sense that one engaged in inquiry always performs acts, it cannot itself be identified with action because it has no particular ends arising from given situations. A person acting as a scientist must free himself from any desire to form opinions simply because they provide a satisfactory basis for action in respect to a certain situation (unlike the religious man who finds his belief about the red appearance of the wafer a satisfactory basis for his actions in respect to certain miracles). When belief is taken as a basis for one's conduct in given circumstances and action is identified with such conduct, Peirce flatly denies that science has anything to do with either.

We believe the proposition we are ready to act upon. Full belief is willingness to act upon the proposition in vital crises, opinion is willingness to act upon it in relatively insignifi-

¹Cf. supra, chap. v, sec. 3.

²In 1905 and thereafter Peirce referred to his doctrine as pragmaticism, maintaining that pragmatism had assumed too many meanings at the hands of other philosophers to remain an accurate designation of his position. Cf. 5. 414.

cant affairs. But pure science has nothing to do with action. The propositions it accepts, it merely writes in the list of premisses it proposes to use. Nothing is vital for science; nothing can be. Its accepted propositions, therefore, are but opinions at most; and the whole list is provisional. The scientific man is not in the least wedded to his conclusions. He risks nothing upon them. He stands ready to abandon one or all as soon as experience opposes them. Some of them, I grant, he is in the habit of calling established truths; but that merely means propositions to which no competent man today demurs. It seems probable that any given proposition of that sort will remain for a long time upon the list of propositions to be admitted. Still, it may be refuted tomorrow; and if so, the scientific man will be glad to have got rid of an error. There is thus no proposition at all in science which answers to the conception of belief [Lecture, 1898, l. 635; cf. l. 55].

In these terms, of course, theoretical and practical considerations must be sharply distinguished. "The two masters, theory and practice, you cannot serve. That perfect balance of attention which is requisite for observing the system of things is utterly lost if human desires intervene" (l. 642). One acts as a theoretical scientist, then, only when he seeks truth and scorns any desire of finding a basis for his own future actions. To be sure, the intellectual purport of the conceptions which the scientist seeks lies solely in practical consequences or a possible bearing upon future conduct, but this means only that scientific propositions always have the form "if certain acts or experiments are performed, then certain results will follow" (cf. 5. 9). Nothing whatsoever is said about whether these results will satisfy the personal desires of the scientist or of any other individual. The meaning of any intellectual conception is thus ultimately a question of how it will subserve the summum bonum--how it will lead to truth--and not of its practical application in a particular situation.¹

Truth as a phase of the summum bonum may thus be described as the supposition that individual men can so act that their personal desires are sacrificed for the attainment of the one opinion concerning any question which is destined to be sustained in the long run by inductive inquiry. This is, of course, equivalent to the supposition that the actions of individual men can be brought into accord with the calculus of probabilities. There is no difficulty in explaining the meaning of this supposition by the pragmatic method, since there is clearly a sensible difference between

¹Cf. supra, p. 160.

holding to personal desires and sacrificing them for the purposes of induction. However, the truth of the supposition can nevertheless not be tested by the inductive method since it is precisely the presupposition of all induction. Inasmuch as the question is one concerning possible motives or ends of human action, it can only be examined in terms of an analysis of such ends, namely, in terms of ethics and esthetics. These latter sciences, as was seen above in the preceding chapter, can make no appeal to results of induction and hence can receive no aid from the natural sciences. They are forced to turn for principles to dictates of conscience, to qualities of esthetic feeling, and ultimately to faith.

The circumstance that logic and the natural sciences must depend on faith in the capacity of men to act unselfishly is thus consequent upon Peirce's pragmatism rather than being inconsistent with it. For if all intellectual meaning consists in a possible bearing on future conduct, the purposive actions of the scientist become the basis for any determination of the subject matter of science. It is only in so far as these actions are governed by a single motive (namely, to follow the rules of induction) which is completely independent of the peculiar motives relative to the accidents of individual scientists that this subject matter can possess the unique determination which justifies its being called reality. The apparent paradoxes of Peirce's system do not arise from any direct conflict with the pragmatic method (since the statements about the *summum bonum* can be given a meaning in terms of conceivable practical effects) but from the fact that the inductive method is the only satisfactory method of establishing a true proposition and yet is incapable of establishing the proposition upon which all science must rest.¹

4. Pragmatic Philosophy

A. Peirce's pragmatism was examined in the present chapter in terms of the process which begins with perception and ends in purposive action, and was found to be concerned properly only with

¹W. H. Hill, in an article "Peirce's 'Pragmatic Method,'" Philosophy of Science, Vol. V, argues that Peirce's system ends in paradoxes similar to the ones which have been mentioned here. However, by confusing Peirce's pragmatic and inductive methods Hill makes it appear that the paradoxes arise from a conflict with the pragmatic method.

that aspect of the process which was subject to self-control, namely, the passage from the indubitable perceptual judgment to the general idea or expectation arising from that judgment. By the principle of continuity, the judgment and the expectation shade into each other so that one can never be certain that his first principles are indubitable judgments and not disguised hypotheses. This view of perception as the source of both genuine and spurious indubitability led to the doctrine of critical common-sensism. Since reasoning can function only negatively in respect to first principles, namely, since it can only aid in showing which ones are not indubitable, a faculty of instinct was necessary in order to explain the positive determination of genuinely indubitable principles. While perception is thus the point of contact between individual minds and the world of facts, it can determine being only as something felt, namely, only as reaction with singulars, and the principles which it supplies are "invariably vague." Being as reality or as something clearly understood (represented) always involves a reference to future experience and is consequently general--a circumstance which led to Peirce's doctrine of scholastic realism. The doctrines of critical common-sensism and scholastic realism are consequences of Peirce's pragmatism in that if intellectual meaning consists in a possible bearing on future conduct, all inquiry must begin with individual experience (which is the only way conduct is ever immediately affected) and end with purposive action represented by general ideas (which afford the only means of understanding reality as what possibly affects future conduct).

The passage from perception to purposive action constitutes the process represented by the third column in the diagram of Peirce's system presented at the close of the preceding chapter. That is, it is the process of inquiry, the process governed ultimately by the summum bonum, just as processes within the psycho-physical universe are governed by objective idealism and the course of external events is governed by objective logic. However, since the psycho-physical universe can be determined only by the objective probabilities expressed in the course of external events, and since these probabilities can in turn be determined only by the process of inquiry governed by the summum bonum, the final determination of things and the order among things must be given by an analysis of the process of inquiry.

In these terms, Peirce's entire system may be regarded as comprising various analyses of a single process. In the upper realm: pure mathematics determines the forms of relation governing any conceivable process; phenomenology shows that these same forms determine constituents of every experience, including that of the mathematician as he constructs diagrams which reveal such forms; finally, the normative sciences show that every process exhibiting the forms determined by mathematics and possessing the experiential constituents determined by phenomenology must also be regarded as a process of action, as a process directed toward a definite end. In the lower realm, the forms, experiential constituents, and ends of action must be related to reality--to the external permanency of facts independent of the constitution of experience. The identification of the universal forms of experience with the forms of reality is possible without the assumption of an inexplicable order of things in themselves only by a justification of such identification through an appeal to the capacity of men to act in a manner which in the long run is destined to determine the real order of any process. In other words, since reality must be defined with reference to the final end of inquiry, and since this end is a phase of the summum bonum, the ultimate determination of modes of reality must be given by the recurrent stages of inquiry as reflecting "elements of coöperation toward the summum bonum."¹ The stages of inquiry--for example, immediate percept, sense of reaction, and hypothesis; abduction, deduction, and induction--all reflect the same formal elements, firstness, secondness, and thirdness, so that by this means and not by an ontological assumption the categories are properly shown to determine modes of reality. By virtue of this appeal to ends of action a continuity between the two realms is established: the real orders among things may be identified with possible ends in the process of experience, namely, with ends of inquiry. Every concept in Peirce's system (including those in the upper realm which are not determined by inquiry into reality) may thus be reduced to formal, constitutive, or regulative analyses of the process of experience.

In his later writings Peirce spoke of various proofs for the doctrine of pragmatism. These proofs may be regarded as falling into two distinct kinds. According to a fragment, circa 1905,

¹Cf. supra, p. 161.

in constructing the doctrine of pragmatism the properties of all indecomposable concepts were examined and the ways in which they could be compounded. Then the purpose of the proposed doctrine having been analyzed, it was constructed out of the appropriate concepts so as to fulfill that purpose. In this way, the truth of it was proved. There are subsidiary confirmations of its truth; but it is believed that there is no other independent way of strictly proving it [5. 5].

In this sense, pragmatism was "designed and constructed . . . architectonically," so that it is based on the sciences prior to logic and hence ultimately on the simplest mathematics and phenomenology (cf. 5. 469). The subsidiary confirmations of pragmatism would involve only the principles peculiar to speculative grammar. In Lecture I (1903) Peirce explained the proof of the pragmatic maxim as resting on a logical analysis of the nature of belief, judgment, and assertion, and cautioned that while his "original article" carried the analysis of belief "back to a psychological principle," yet in view of later development, "all attempts to ground the fundamentals of logic on psychology are seen to be essentially shallow" (5. 27-29). In this same passage he also mentioned evolution as a factor in explaining how man's mind was constructed as it is in respect to belief, and in the first article in The Monist (1905) he declared that a proof of pragmatism "would essentially involve the establishment of the truth of synechism" (5. 415). It does not seem likely that Peirce means to base pragmatism on doctrines of cosmology, since these doctrines were themselves formulated with the aid of the pragmatic method. The alternative interpretation would be that he intends a reference to the architectonic proof of pragmatism involving the mathematics of continuity and its implications for a theory of evolution.

While pragmatism within the framework of Peirce's system is thus not a basic presupposition insusceptible of proof, its peculiar place within that framework provides justification for calling the entire system pragmatic philosophy. Phenomenology shows that the one intelligible element in every experience consists in a relation mediating between the given percept and future percepts, and since a symbol is merely such a relation viewed in respect to the fact that its formation involves conscious control, it follows at once as a maxim for any formation of symbols that the intellectual purport of a symbol consists solely in a reference to the future experience of the users of that symbol. But then the intellectual purport of the symbol "reality" must be explained finally

as the object of any symbol whose truth has been confirmed by continued experiments extending indefinitely into the future. Hence, the ontological presupposition of the correspondence between symbols and reality (considered in speculative grammar) can be explained ultimately only in terms of actions or experiments performed by the users of symbols. The mathematics of induction (the chief consideration of critical logic) provides the necessary rules for such actions and the analysis of possible ends of human action as they relate the use of symbols (the concern of speculative rhetoric) shows the extent to which these rules can be followed. Pragmatism, then, may be regarded as the expression of the essential characteristic of Peirce's philosophy; for it is precisely the pragmatic maxim which states the conditions for all determination of reality.

B. Peirce's early essays comprising the Search for a Method, examined in Part I of the present study, may now be viewed as giving an incomplete presentation of the pragmatic philosophy systematized in his later writings. The essays on the classification of arguments and the categories denied any possibility of basing logic on the nature of things or of thoughts and insisted that all important concepts of logic must be explained solely from the nature of symbolic processes. This approach leads inevitably to the logic of relatives and requires the distinction made in Peirce's final systematization between the purely formal analysis of kinds of relations (the simplest mathematics or formal logic) and the analysis of relations as affording prescriptions for any employment of symbols (logic proper). The next group of essays showed processes of thought and inquiry to be formally identical with symbolic processes, so that the faculties of knowledge or the material conditions for the existence of thought and inquiry could be determined only by the concepts of formal logic. Just as term, proposition, and argument were identified and distinguished at various stages in symbolic processes, so feeling, sensation, and inference could be identified and distinguished at various stages in processes of thought and inquiry. Such procedure establishes the synechistic view of mind and leads to the distinction between phenomenology, or the examination of experience merely as the expression of formal elements, and cosmology, or the analysis of reality in terms of its most general components, mind and nature.

Since processes of thought and inquiry are existentially

kinds of actions performed by individual persons, in the final group of essays there arose the problem of freeing these actions from individual differences and bringing them into accord with the laws of symbolic processes. The pragmatic method of making ideas clear provided a solution for this problem inasmuch as it afforded the means of clearing ideas from the vagaries of individual experience. However, in respect to the truth as distinguished from the clearness of ideas, there could be no assurance that the actions of any person or finite group of persons would prove decisive. It followed that a person with a clear idea of reality would not inquire into reality with a hope of satisfying any finite desires but would identify the ends of his action with those of an unlimited community. But then the paradoxical result that everything is rendered explicable only by an inexplicable faith in the indefinite extension of human inquiry seemed inevitable. This analysis leads to Peirce's later discovery that logic finally depends on a determination of the summum bonum--on esthetics and ethics, and the paradoxical character of his system thus becomes dialectically defensible in that rational inquiry is now made dependent upon a faith in the ultimate end of action which cannot be regarded significantly as a proposition susceptible of inductive examination. There follows, moreover, a sharp distinction between the beliefs of the scientist, which are in the nature of opinions tentatively adopted as hypotheses in the course of inquiry, and the beliefs of the practical man, which are in the nature of resolutions steadfastly maintained as a basis for action in the course of life.

